RAILROAD GAZETTE

SATURDAY, OCTOBER 19, 1872.

Construction of a Street Railroad.

As many of our readers are probably interested in the construction or operation of street railroads, we give herewith a description of one which is now being laid in Twenty-third street, New York. The pavement being removed, an excavation of the necessary width and about 18 inches deep is made, and this is filled for a depth of some 12 inches with a coarse gravel, such as is used as a bed for ordinary stone pavements. In this gravel are bedded the cross-ties, which are seven inches wide by five inches thick and about seven feet long. In this case the ties are placed about five feet from center to center; but we believe that it is not usual to place them so close together, six feet being a more usual interval. On these ties are laid the longitudinal stringers, which are five inches wide, seven inches deep, and run about 25 feet long. They are secured to the cross-ties by means of cast-iron brackets, of the form shown in the engraving, which are spiked to both the stringer and cross-tie by three-eighth-inch spikes about 3½ inches long. Two of these brackets are used at each cross-tie, except the one at which the joint between the stringers comes, where four of the brackets are used. The substructure is now ready to receive the rails, which are spiked to the stringer by half-inch spikes, about five inches long, driven about 21 inches apart. Under the joint between each two rails a flat, wrought-iron plate, about 16 inches long, the same width as the rail and ⅛in. thick, is placed, to prevent the ends of the rails from being bent or driven down into the wood. The rail used in this case is somewhat heavier than that ordinarily used, and is of a peculiar section, as shown in the engraving. It is claimed that it presents less obstruction to the wheels of vehicles than the common street rail. The weight of the rails is about 50 pounds per yard, and the rails average about 26 feet in length. The rails being in place, nothing remains to be done but to fill in to the required depth with gravel, rammed down hard, and to put down the pavement, in this case the ordinary s one-block pavement in common use in New York. The road whose construction we have described is built with unusual care, and may, perhaps, serve as a model for other constructions of the kind.

The Spheroidal State of Water and Boiler Explosions.

At a meeting of the British Association, Mr. W. F. Barrett, F. C. S., read a paper on the spheroidal state of water, and its possible relationship to certain boiler explosions. The follows is an extract: "On one occasion, some six years ago, I wanted to cool a red-hot copper ball. For this purpose I plunged it into some water in which I had just washed my hands. The hot ball went in without any hissing or visible evolution of steam, and on removing it from the water it appeared as hot as before, in fact it remained brightly incandescent, somewhat below the surface of the water. I was astonished to see this, as I did not know that the spheroidal state of water could be so readily produced and maintained by a body at this temperature. So I tried other red-hot bodies in the same water and with the same result. I then threw away the soapy water and used plain water;' the result was now quite different, the hissing was loud and the evolution of steam copious. Hence the soapiness of the water was concerned in the phenomenon. Adding a little soap to the water immediately reproduced the result first noticed. Other bodies that dissolved in water were also tried and the results are briefly these: Albumen, glycerine and organic liquids generally facilitate the acquisition of the spherical state, probably by increasing the cohesion of the water, while of course bodies, such as ammonia, which readily yield vapor have the same effect, but not so marked. Oil shaken up or even placed on the surface of the water has the same effect as the soap. The best method of exhibiting the experiment is to pour a little of Plateau's soap solution into a large beaker of water, and then, by means of a hooked wire, lower into the liquid a white-hot metal ball, some two pound weight, and of copper is best. The ball smoothly enters the water, and glows white-hot at a depth of a foot or more below the surface. Notwithstanding the considerable hydrostatic pressure it is seen to be surrounded by a shell of vapor, perhaps half an inch thick. This vapor shell is bounded by an envelope that resembles burnished silver, and has a most striking appearance. In fact, the hot ball blows a soap bubble of steam, from the limiting surface of which the light is totally reflected. As the ball cools (mainly by radiation) the shell of vapor is seen to grow thinner, and finally collapse altogether, when immediately there follows a loud report, volumes of steam are produced and often the glass is broken. I have hea d that traces of oil often get into the boilers of steam-engines, and there can be no doubt that dissolved organic matter often finds its way in. If in any way we increase the density of the water we render it possible for a corroded boiler to give way under the pressure of the steam suddenly generated in the way I have indicated."

Railroad Manufactures.

The Erie Car Wheel and Car Works employ about 450 men in their works at Erie, Pa. The capacity of the works is 100 car-wheels, and from six to eight flat, gondola or box cars per day. They are now erecting a large foundry, through which it is intended to increase their wheel product 250 per day, making 350 in all.

The Adrian Car Company, at Adrian, Mich., employs 385 men; has $250,000 invested in buildings and machinery; has a capacity of ten flat or freight cars per day, and one first-class passenger each week. The sales for 1872 will go beyond $1,000,000.

The Baltimore & Ohio Railroad Company's rolling mill manufactured, a few days since, a rail 76 feet in length, weighing 60 pounds per yard.

Olmstead's Electric Break.

General W. B. Chapin is in England trying to call attention to this brake, and has had it applied to a train on the North London Railway and a public trial made, which is reported to have been satisfactory.

Contributions.

PRACTICAL FIELD ENGINEERING.

NO. VIII.

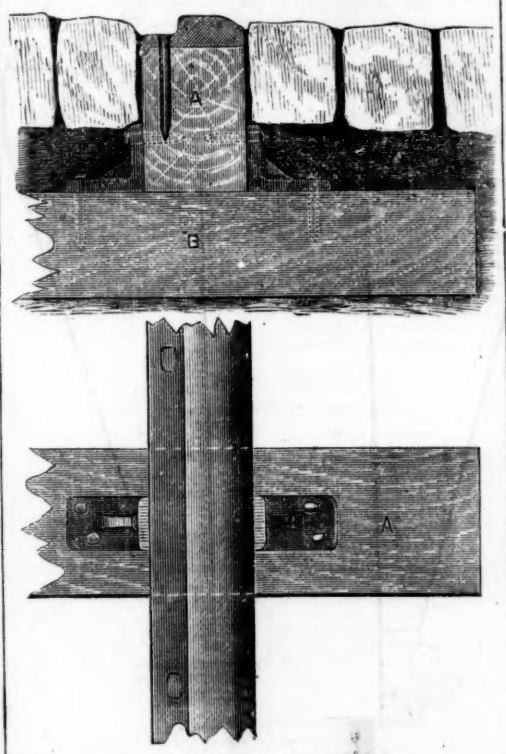
TAKING CARE OF A DIVISION.

By any one who has had the least experience in railroad field engineering it is well known that in taking charge of a division the engineer becomes responsible for the right performance of many things not strictly the subjects of engineering skill, and not even mentioned in the text-books of engineering science. The purpose of this paper is to direct the inexperienced engineer in the performance of these essential, if not strictly professional, duties. And first of

GRUBBING AND CLEARING.

After the right of way has been secured along the located line, "grub-stakes" should be set on each side of the center line to show the width of the right of way. These stakes should be at least three inches square and not less than three feet long, driven firmly into the ground. In a level country they need not be less than two hundred feet apart in the direction of the line.

Grubbing is dispensed with where the working profile shows two feet or more depth of embankment, and in no case is grubbing required farther from the center line than the side cross-section stakes, unless it is where borrow-pits are to be made. But where timber is removed without grubbing in the case of an embankment the stumps of the trees must be made as low as possible. The engineer must see to this. Where timber is grubbed the roots and stumps must not be thrown upon the land of the adjacent farms to irritate the owners, nor must they be scattered along on the right



of way. Have them dragged into heaps, and burned if possible. If in the deed conveying the right of way to your company the timber is reserved by the persons owning the land, they should be notified to remove it; but if, on the other hand, the timber is passed with the right of way, you should see that it is properly cut so as not to spoil its usefulness for stringers, ties, caps, posts or culvert sills. By a little care and attention in this matter a great saving of valuable materials may be secured.

The laborers employed to clear and grub the right of way are not generally very attentive to orders concerning the preservation of the center and side stakes of the line, and you will find it worth while to see that these are not disturbed by the diggers or by the teamsters dragging heavy logs over them.

If it happens that you have made a bench on the root of a tree which has to be grubbed, you should take your level and transfer the bench to some other and permanent object, especially if there be heavy earthwork or a bridge near the point.

"WITNESSING" PARTICULAR POINTS.

It is often a great saving of time and vexation to fix certain points in the located line so that if the center stakes are knocked down or dug up you may easily find the precise place at any time. Say, for instance, you wish to "witness" a P. C. You have only to set your transit over the point and fix a well-driven stake on each side of the line, say one hundred feet out, and at right angles with the tangent. Then, should your P. C. stake get removed, to establish the point you have only to stretch a line from one of your witness-stakes to the other and drive your P. C. at the middle. Any important point, the commencement of a trestle, the point of compound or reverse curve, etc., etc., may be thus witnessed.

EXCAVATIONS.

If it can be avoided, never allow contractors or hired graders to waste the dirt of excavations on land outside of the right of way. If the dirt cannot be used in embankment, have it thrown out in such a way as to injure as little as possible the lands owners along the line. Some care in attending to this will save troublesome and not unfrequently expensive law-suits.

At each end of a considerable cut your grade-stakes are very apt to be dragged down and lost by the laborers, and to avoid the trouble of having every day or two to reset these stakes it is important to fix two stakes driven to grade at convenient distances at each side and in a line with the center stake; the laborers or the boss can then easily find grade by sighting over the tops of these stakes.

Cuts of any considerable depth and length should be commenced so as to be *worked up grade*. By this means the excavation will in wet weather drain itself so that the water will not interfere with the progress of the work, whereas if it is commenced at the *upper end* and *worked down grade*, the cut will, in rainy weather, be filled with water.

It is frequently the case that large boulders and the stumps of trees are left clinging by a frail tenure to the sides and edges of cuts. This the engineer should not allow, for after a few rains and a few freezes these heavy masses will tumble down the slopes and lodge in the ditches, causing great trouble and annoyance. A little attention will enable you to prevent all those apparently trivial negligences that go to make up the sum of a most disagreeable sloveliness, often plainly marked on the earthwork of railroads.

EMBANKMENTS.

Where embankments are not too high, stakes driven to grade—that is, so that their tops mark the surface-line of the roadway—will be found sufficient to guide the laborers in their work, and your level will not again be needed till you have to take your final measurements. You should be sure that the full slope is given to the sides of embankments, and that the top-width is nowhere under measure.

Grading contractors have a bad habit of piling logs, stumps, brush, &c., into a line of embankment and covering them with the dirt. Look sharp and see that this is not done.

Where a gap is to be left in an embankment for a trestle, stakes should be driven to mark the end slopes, which should be at the ground-sill of the first full bent. The embankment should be made somewhat higher than grade, as it will settle after lying a few weeks. The road-bed should be nicely surfaced, leaving no bumps or depressions to interfere with the placing of the ties. After embankments are finished you should not allow the teamsters hauling timber and ties to drive across or on top of them. It spoils their symmetry and cuts them into ugly ruts, from which it often happens that tracklaying is greatly delayed just when you are in the greatest hurry.

When an embankment is on a considerable curve, you should closely watch its formation to prevent those unsightly breaks in its regularity so often made by inexperienced or careless bosses. Nothing is uglier than a curved embankment whose outline is marred by ill-rectified mistakes in its formation. Contracts should be plainly drawn touching such things, and the contractor's estimate mercilessly "docked" for any palpable fraud or neglect.

In fact, the engineer in charge of the construction of a part or the whole of a line of railroad must be watchful, self-reliant and firm. He must have things his own way, and any one under him who wilfully neglects or refuses to do the duties assigned him should be promptly discharged from service. Meantime the engineer must as rigidly fulfill his own duties. To this end he must be a constant student of his profession and wide awake to catch practical information from any source. Not unfrequently a well-educated and experienced engineer will find a rough hint of great value set like a gem in the remark of an uneducated track-layer or carpenter.

You cannot go over your work too much. See every part of it as often as you can. Inquire of the workmen, passing from point to point, as to the progress of work along the line. A field engineer is nothing if he is not active, energetic and fully alive to the importance of his position.

HEADQUARTERS.

For a great part of the time your headquarters must necessarily be "in the field" at some distance from the railroad engineer's office. Most frequently you will probably find a farm-house situated near the center of your division the best place at which to board and keep your instruments—that is, if the country is thickly settled. Your rodman and other assistants ought, if possible, to board at the same place with you in order to insure promptness in getting to work. And further, if your rodman is fit for his place, he will often be of great assistance to you in making necessary calculations, rough drafts, etc., which can be done after supper by candle-light in your room.

Wherever your headquarters may be, there you must keep your level, your transit and a case of drawing instruments, besides paper, pens, ink, pencils and such of your field-books and working plans and profiles as you may need. A good pocket-book of engineering, containing useful tables, should be con-constantly at hand.

The next paper of this series will treat of the proper methods of setting out and constructing the various kinds of railroad culverts.

HOOSIER.

Surface Condensers.

In a paper read before the Cleveland (English) Institute of Engineers, by Mr. R. C. Oldknow, R. N., one of the engineers of the Queen's yacht Osborne, he states that "he is afraid there is no doubt that the life of a boiler in the Royal Navy has been shortened from an average period of nine years to five years only, where surface-condensers are fitted. The cause of this unfortunate state of affairs is to a certain extent as much unknown as any effectual remedy for it. Galvanic action is a vaguely convenient term that carries but little meaning with it. Perhaps the fact is that the same conditions may bring about some chemical change in the order of things of which we are at present ignorant. Anyhow, boilers wear out very fast, and no cure has yet been come at. Zinc plates have been suspended in the boilers, but without doing much good; though it is believed that their action, as far as it goes, is beneficial."

It will be remembered by those who were present at the last Convention of the Master Mechanics' Association that the effect of distilled water upon boilers was referred to during the discussion of the report on incrustation.

Ventilation and Warming.

TO THE EDITOR OF THE RAILROAD GAZETTE:

From the energy with which, a year or two since, you entered upon the subject of the ventilation of cars, I expected that you would have exhausted your patience, and would have given up before this, in perfect disgust at the total want of appreciation in the traveling public of your kind efforts on their behalf.

But from the persistence with which you pursue the subject, and the intelligent thought you give it, it really does look as though you would finally succeed in creating a complete revolution in this much neglected department. But from whom you will get your pay I must confess I am quite at a loss to discover.

The difficulties to be overcome, however, are very great, and if you should be discouraged by getting ten good round abusings for every time you are praised, you would be likely to give it up.

For instance, the next morning after reading your very interesting article in last week's GAZETTE, in which you recommend the opening of a valve directly over the front and rear doors, I was coming down from Middletown on the morning express and found myself seated in a new car that had just been fitted up as you recommended. Of course I watched with much interest the effect upon the air of the car and upon the opinions of the passengers. The car was well filled at Middletown, and, after riding thus crowded for an hour and a half, and with only one window accidentally open, at which I think more air went out than came in, there was scarcely a perceptible taint of impurity, and the air of the whole car was quite fresh and vigorous. Just before reaching the city, I stepped across the car to get an opinion regarding the ventilation of the car from a very intelligent gentleman, who, I knew, rode in that train daily. He said he thought it was a very good thing; but he had scarcely finished the sentence of praise before the man sitting in the same seat spoke up very energetically: "It was the meanest thing that was ever invented; it was a perfect outrage upon the passengers; it would kill more persons in a single week by giving them their death-colds than are killed by all the railroad accidents in the United States; and as for his part he shut it up every chance he got."

Now this, you see, was a pretty decided protest against a pet notion of ventilation, and one which I thought was very good, and if it was not that I had been accustomed to meeting just such rebuffs constantly for the last twenty years it might have made some impression upon me. I took a quiet look at the object, and although he had kid gloves and a heavy gold chain and perhaps a large diamond breast-pin, and rather an intelligent-looking countenance, yet I thought it would be about as difficult to convince him that the killing of the passengers he protested against so energetically would be more likely to occur from breathing foul air than from an extra draught from that ventilator, as it would to convert a Jew to the Christian religion; so I quietly asked him what Greeley's prospects were in Orange County.

Now, you see, there was a man with intelligence, shall I say, about equal to that of the average traveler, who had been riding in a crowded car for an hour and a half, and the car had been perfectly ventilated without the slightest inconvenience to him. And yet, because he had on some previous occasion, when riding against a stormy head wind, noticed a little unpleasant draught, therefore he would condemn the whole system, and rather sit and inhale the foul air from the diseased lungs and the exhalations from the dirty bodies of his fellow-passengers.

I notice one of the questions addressed to the master car-builders is:

"How many cubic feet of fresh air do you think should be supplied to each passenger per minute, in order to keep the air in a car pure?"

Now to answer this by attempting to measure all the air that enters the car, with an approach to mathematical accuracy, would probably show in a conspicuous manner one of the great difficulties attending the satisfactory ventilation of cars. The extreme variations of the amount of air supplied through the same openings, and the rapidity with which these variations take place, would greatly surprise the uninitiated. For instance, when running at the rate of forty miles an hour *against* a strong wind which is moving with the same velocity in the opposite direction, an opening one foot square will admit over 700 cubic feet per minute, or over 17 cubic feet for each of 40 passengers; *with* that wind, there would be no current whatever. The difference between standing at stations or in depots and running at full speed is also very great.

It is these constant, rapid changes that make it very difficult to devise any automatic arrangement to meet all conditions. Intelligent supervision on the part of conductors who can instruct their brakemen and firemen is of great importance, and I think to secure the interest and attention of these gentlemen is of as much importance as any invention that can be made.

You say in your issue of October 12, that you will discuss the question of heating by warm air and by radiation. I hope you will take strong ground in favor of *some* radiation and against too much warmed air. All warm air is necessarily debilitating and a perfect whirlwind of ventilation will not prevent very uncomfortable feelings if we are surrounded with and are breathing air of nearly the temperature of the blood. We must constantly bear in mind the fact that there is twice the physical action, that the blood circulates twice as rapidly, when breathing air at 100 deg. as when we breathe air at 90 deg. What we want, therefore, is a positive heat in the solid materials near the floor, or, in other words, to have the floor warmed, and to have a current of cooler air circulating across the top of the car and around our heads.

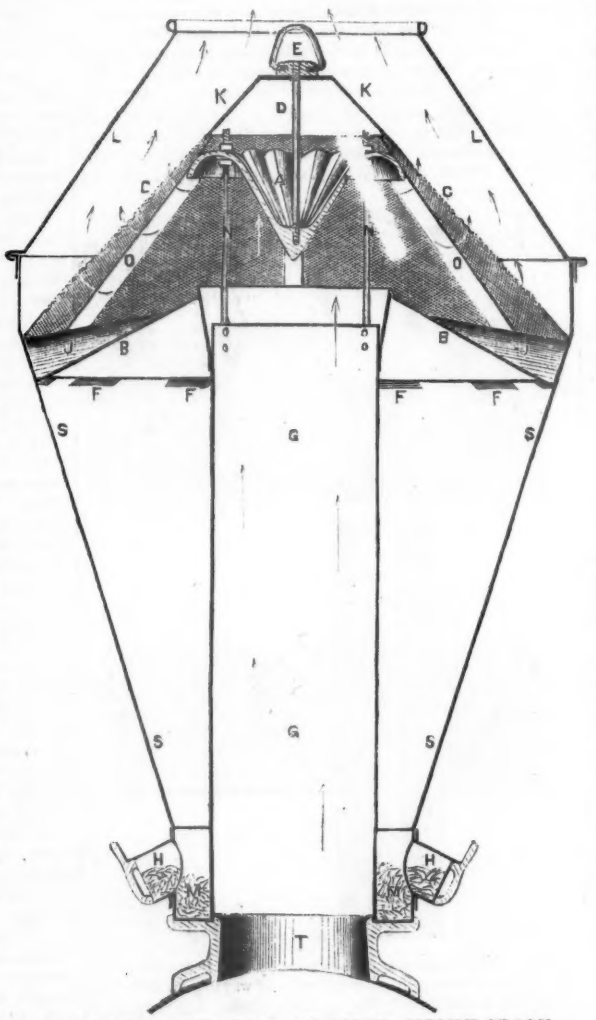
The practical results are very favorable of that simple arrangement you have so frequently referred to of having a stove in each end of the car left exposed for direct radiation, and then to have the window immediately in front of it raised, *with the blind pulled down*.

This arrangement is so good, and yet so simple, that it ought to be repeated until every conductor in the land would as soon think of taking a car out of the depot unswept as to take it out without this arrangement for ventilation.

It is of importance that the blind should be drawn down, because this directs the current of cooler air flowing in toward the ceiling, and it mixes with the warmed air rising from the stove and falls so gently through the car that even that Middletown gentleman would not know that it was open one time in one hundred, unless he saw it.

Of course there are more perfect ways of distributing the heat over the whole bottom of the car, as by the hot-water pipes now used on many of the best roads, which, when the proper system of ventilation is connected with it, makes a very comfortable car; but I allude to the method of ventilating a stove-heated car because it can be done at any moment by any passenger, and applies to such a large portion of our cars, which are heated by stoves.

L. W. LEEDS,
Engineer of Ventilation and Warming.
No. 110 Broadway, New York.



RADLEY'S NEW COAL-BURNING SMOKE-STACK.

Radley's New Smoke-Stack.

The name of the inventor of the stack which is illustrated herewith has been associated with the celebrated Radley & Hunter wood-burning stack for half a generation or more. As coal has to a very great extent been substituted for wood as the fuel for locomotives, it has become necessary to provide a stack suitable for the latter fuel in many places where the old Radley & Hunter stack was formerly in use. Our engraving represents the plan which has been designed and patented by Mr. James Radley, of New York, who, it may not be amiss to say, is the original Radley of Radley & Hunter. This design is the result of long experience in the use and manufacture of smoke-stacks and spark-arresters, and has been carefully experimented with for a year or two past, and thus perfected and developed into its present form.

S, S, is the ordinary outside shell of the stack; *A* the deflecting cone, which is grooved or corrugated as shown in the engraving. The object of these corrugations is to receive the sparks and cinders which are carried up the inside pipe, *G, G*, by the exhaust, and thus, as it were, shelter them from the violence of the exhaust steam and direct them down the inner face of the wire gauge *C, C*. *B, B*, is a disc with the convex surface upward, and is attached to the inside pipe *G, G*, near its top. The diameter of the disc is about two inches less than that of the outer case *S, S*, thus leaving an annular space one inch wide between them. On top of *B, B*, are riveted from eight to twelve angular sheet-iron pieces, *J, J*, which project an inch beyond its outer edge, and therefore fit snugly into the case *S, S*, thus forming a number of oblong holes, *F, F*, through which the sparks caught by the wire netting fall into the chamber *S, S*, from which they are removed by the openings *H, H*.

D is a cast-iron bonnet, to which the frame, *D, D*, is attached, which is covered with the wire cloth, *C, C*, and extends down below the mouth of the inside pipe, *G, G*. The smoke and steam pass into the open air through this netting, but the sparks and cinders are arrested by it and are carried down into the chamber, *V, V*, as explained.

N, N are rods which support the cone, *A*. *D* is a bolt screwed or cast into the cone for the purpose of holding the bonnet in its place. *E* is a nut screwed in the end of the bolt, *D*, and with a ring or bail, *E*, attached to it for the purpose of attaching a hoisting apparatus for lifting the stack in putting it on or taking it off an engine.

These stacks are manufactured by the Radley & McAllister Manufacturing Company, whose office is at No. 21 Courtlandt street, New York.

The Master Car-Builder's Association.

The following circulars, with the interrogations given, have been sent out to the members of the Master Car-Builders' Association by the committees on the subjects named below, addressed "to Master Car-builders and Foremen of Railway Car Shops:"

ON TRUCK AND CAR-BODY CHECK-CHAINS.

1st. In your opinion, are check-chains, as usually applied from trucks to car-bodies, an attachment of value as a safeguard?

2d. Do you think an attachment could be practically applied from trucks to car-bodies, so as to be of real value, should the wheels leave the track?

3d. Are truck check-chains used on your road? If so, how many to each truck, how applied, and at what angle would the truck stand to the car when the check-chains are drawn taut?

4th. Can you refer to cases where check-chains have been of service when cars have been thrown from the track?

5th. With your experience, would you advise that cars, in case of accident (when the wheels are off the track), should remain coupled or otherwise?

6th. Any other information bearing upon the subject, not suggested by the above questions, will be cheerfully received by the committee.

C. C. MILLAR, Chairman,
Central Railroad of Georgia, Savannah, Ga.
W. J. CALAIS,
Wilmington, Columbia & Augusta Railroad.
J. N. KING,
Chesapeake & Ohio Railroad.

ON BRAKES.

1st. What kind of material do you use for brake-shoes, and what is your experience with such material?

2d. What method of hanging brakes is now used on your road, as applied to freight or passenger cars, whether between or outside the wheels, on the truck end, or to the carriage body?

3d. Do you use brakes on *both* trucks of such cars; and if so, do you connect them so they can be applied to all the wheels, from each end of the car?

4th. If applied to the wheels from each end of the car, does your connection equalize the pressure of the brakes on all the wheels? If so, please state your method of doing it.

5th. Do you use a safety-brake on your passenger cars? If so, please state what kind, and your experience as to its working.

6th. Do you use a power or train brake, which gives the engineer control of the train? If so, on what principle does it operate and by what name is it known?

7th. Does such brake give the engineer entire control of the train, and is it reliable in all kinds of temperature?

8th. Please give any additional information that you may deem important to enable the committee to make a valuable report on this subject to the next annual meeting of the Association.

R. S. RAMSEY, Chairman,
Pennsylvania Railroad, Pittsburgh, Pa.
HUGH GRAY,
Chicago & Northwestern Railway.
JOSEPH JONES,
New York Central & Hudson River Railroad.

ON CAR ROOFS.

1st. Do you use tin or other metal or canvas for outside covering on passenger car roofs? Please state the quality of the material you use, and how often it should be renewed.

2d. Please state how your standard freight-car roofs are constructed—of what materials, with average cost and durability of same.

3d. With your experience, what would you recommend as the best materials with which to paint metal or wooden car roofs?

4th. Is your road troubled with bills for freight damaged by water through leaky car roofs? If so, what is the cause of such leakage, and what would you suggest as the most effective and durable remedy?

5th. Please furnish any other information on this subject calculated to aid the Committee in making a valuable report.

SAMUEL W. MYERS, Chairman,
Pennsylvania Railroad, Harrisburg, Pa.
C. A. SMITH, Erie Railway.
GEORGE HACKETT,
Central Railroad of New Jersey.

Replies to any of the above inquiries should be addressed to the chairmen of the respective committees.

Catching a Ride.

The following account of the adventure of a lunatic is related by the Chicago *Tribune* of October 3:

"An extraordinary risk and escape occurred yesterday morning on the incoming passenger train of the Wisconsin Division of the Chicago & Northwestern Railroad. As the train, running at a speed of twenty-five miles an hour, approached the County Poor House and Insane Asylum, at Jefferson, the engineer observed a man standing within two feet of the track about two hundred yards ahead. He gave the warning whistle expecting to see the man move off, but as he stuck to his peri ous position, the engineer whistled down brakes and reverse the engine, but not in time to materially check th speed. The train shot forward, and when the locomotiv

came abreast of the man, he gave a sudden spring forward and landed directly on the cow-catcher. The train was stopped as quickly as possible, and the engineer and fireman, and such of the passengers as had noticed the circumstance, rushed out and looked under the cars to find the mangled remains of the foolhardy individual. They searched diligently to no purpose, when somebody shouted, 'Here he is!' There he was, sure enough, sitting comfortably on the cow-catcher, unharmed, save a sprained ankle and a good-sized bump on his forehead. From his peculiar actions and appearance, it was conjectured that he was an escaped lunatic from the Insane Asylum, where he was returned. It transpired that he was one of the convalescent inmates of the asylum who are employed to do farm work, and had slipped away just in time to catch the train for Chicago. Whether his intention was to commit suicide, and failed to connect, or whether he took this mode of getting a ride into the city, no one can tell."

Condensation of Steam in Pipes.

A correspondent of the *English Mechanic*, writing from Cologne, made the following inquiries in the columns of that paper:

"I am desirous of conveying steam of 294 deg. initial temperature, 45lb. super pressure per square inch, through 2in. wrought-iron gas tubes, in all 850ft., underground:—*i. e.*, in the first instance 300ft. horizontally, then 290ft. vertically downward, then again 140ft. horizontally, and finally vertically downward to engine, 210ft. The present temperature within the mine averages 60 deg. I require to know: 1. What amount of total condensation will take place, the steam flowing through the tubes at a velocity corresponding to the requirements of a steam engine 8in. diameter of piston, and making 250ft. (piston-speed) per minute. The tubes to be supposed as non-clothed, but otherwise kept dry. 2. Difference of initial and terminal pressure of the steam, *i. e.*, between boiler and valve chest. 3. The best way to draw off the water resulting from condensation previous to steam entering the cylinder. 4. The waste steam from engine must be carried away by a 3in. tube going up vertically through a shaft direct to surface, a height of 450 ft. This shaft has a strong downward air current, so that in winter it freezes therein to a depth of 70 ft. from surface. There would, doubtless, therefore, be also a large amount of condensation in the waste steam-pipe as well, which, however, could probably be accommodated by a proportionately open tap at the bottom. 5. If the temperature within the mine is likely to be raised disagreeably high by steam-heated tubes and resulting hot water. 6. The probable difference in point of fuel consumption as compared with a close proximity of engine to boiler, all else being supposed the same. If in consideration of there being no dead material, in the shape of rods, cranks, etc., to move, this system may be regarded for draining purposes as equally cheap in point of fuel consumption with the more usual methods. I should, perhaps, mention that the tubes would be suspended freely in the shafts and levels of the mine."

To this letter the following replies have since been published in the same paper.

The following is written from Bath, July 9, by Harry Turton, Engineer:

"As I have had practical experience in a similar case to that of 'A. W. E.,' I think that perhaps the most satisfactory way of answering his seven queries relative to the condensation of steam, etc., will be to state what I have already accomplished.

"About fifteen years ago I took steam down a pit through a total length of pipe of 310 yards. The boiler pressure was 45lb. per square inch, and the total loss of pressure, as near as I could ascertain, about 1lb. per square inch merely. The pipes were 2in., and were well covered with two wraps of hay-band through their entire length, and this, plastered with cement, and then covered with tarpaulin to keep out the wet, as the pit was damp and continually dripping. The engine had an 8½in. cylinder, 260ft. per minute piston speed, and ran for four minutes at a time with intervals between. Close to the engine I placed a steam reservoir, also well lagged, of ten times the cubic capacity of the cylinder, and all the system of pipes was made to slope toward it in order to separate the condensed water. This vessel had a cock at the bottom to draw off the water when required, and I found that leaving the steam in the pipes for ten hours, with the engine standing still, only produced half a bucket of condensed water, showing the great value of well clothing the pipes, and the great economy resulting therefrom. What the difference would have been with naked pipes I do not know, but they would have formed a huge condenser; and seeing how cheaply and easily they may be protected, it can never be worth while to neglect doing so. By treating the exhaust pipes in the same way for a certain distance, the mine will not be appreciably heated. There is no doubt that this system presents great advantages for draining purposes, avoiding heavy cranks, spear-rods, &c., providing the pumps are properly designed to maintain a uniform flow, so as not to have to stop and start a heavy column of water at each stroke. With respect to the employment of compressed air for conveying power, I may add that all methods hitherto employed are expensive, both in first cost and in subsequent working, the only exception being in those cases where there is sufficient water-power available for driving the pumps. The problem is to convert high-pressure steam into high-pressure air with the least possible loss by friction of machinery, and the least possible complication of parts."

Referring to this, "A. W. E.," the original inquirer, wrote:

"A few weeks back, in alluding to condensation of steam in pipes, Mr. Turton, in kindly giving some results of his experience, states this condensation as very inconsiderable, only half a bucket of condensed water from 310 yards of 2in. hay-banded and plastered piping in 24 hours.

"Having a practical object in view, it has been a matter of considerable interest to me to obtain data on this head before going to the expense of laying down extensive lengths of steam piping, and I was accordingly much interested in the particulars given by Mr. Turton. There exist, however, some experiments by a continental engineer which do not confirm the view taken by Mr. Turton, and which I should have been glad to have been able to subscribe to, had I carried out my object, and the unfavorable results attained by these experiments have deterred me from as yet carrying out my project.

"As the communication of these experiments cannot but serve a useful purpose, and will doubtless elicit comments thereon, I take the liberty of subjoining the particulars:

"Temperature of the locality in which the experiments were carried out=4 deg. C. Steam pressures employed, p.=1½—2; atmospheric temperatures, T=125—135 C.

	Resulting Condensed Water per Hour per Square Meter of Surface.
1. Cast-iron pipes without any covering	2.84 kilo.
2 Cast-iron pipes covered with a patent substance, consisting of clay and calf's hair	1.56 "
3. Cast-iron pipes covered with a longitudinal covering of straw ½in. thick, and bound with straw bands	0.98 "
4. Cast-iron pipes covered with baked clay pipes, and these again coated with straw and clay plaster	1.12 "
5. Cast-iron pipes covered with a species of woollen offal (used for cleaning machinery)	1.39 "
. Cast-iron pipe covered with felt	1.53 "

"The best of these results (3), with pipes coated much as those with which Mr. Turton experimented, gave no less, as we here see, than 0.2lb. of condensed water per English square foot and per hour, so that upon 310 yards of 2in. piping there would have resulted on this estimate no less than 15 cubic feet of condensed water in 10 hours, all other conditions being equal.

"In the face of such differences of practical experience I have, as may well be imagined, not ventured upon laying down steam piping of the great length I require, fearing the immense loss which may occur from condensation. I trust, however, that the further results of experience and experiment on this interesting practical question may find expression in the *English Mechanic*, it being certainly of great importance (to miners especially) to determine whether it be cheaper to convey fresh steam to long distances for operating machinery direct, or to compress and convey and use air for this purpose.

"The engine which Mr. Turton describes, presuming upon its being constantly, instead of intermittently, in action, would very likely use some 4,520 cubic feet of steam per hour, representing about 10 cubic feet of water evaporated per hour in the boiler. If the loss from condensation in the conducting-pipes equaled that resulting from the best of the experiments I have communicated, a further quantity of 1.5 cubic feet would have to have been evaporated, making a total of 11.5 cubic feet per hour, of which over 13 per cent. would have been lost by condensation in the pipes alone. Compressed air would show no loss in this way—the temperature not necessarily rising above that of the surrounding atmosphere of the mine; but there would be a considerable loss in creating it, whereas in its using, in connection with an engine working expansively, it would, probably, be as effective and as economical as steam. As to this, however, I have unfortunately no data, and hope, therefore, correspondents who may have had experience with the employment of compressed air as a motive power will favor us with their practical results. Would it, perhaps, be possible to deal with the question in the following way? If a given brake horse-power be employed in compressing air, what proportion of this power, expressed in exactly the same terms, would be obtainable from an engine working expansively in the ratio of 1:3, using the whole of the air so compressed as a medium of power and motion? If this were determined it would be possible later on to compare it with steam when used in the same way at long distances from the generator."

A great deal of speculation and experiment is now directed to the use of compressed air for conveying power long distances, and as the subject is important and of great interest to those in charge of mines and works which are located at considerable distance from each other, as is often the case with railroad shops, we hope that those who have any valuable experimental or theoretical knowledge of the subject will communicate it to us.

The following extract from a San Francisco paper indicates that the transmission of power by steam or compressed air is likely to assume a practical form:

"A petition has been presented to the Board of Supervisors by H. J. Booth, Horace Davis, Joseph G. Eastland, A. J. Moulder and James R. Smedburg, asking that they be allowed the priviledge of laying pipes for the transmission of steam through Folsom, Howard, Market, First, Fremont and Beale streets, from a central system of boilers, to manufactories that need such power. Another petition is under advisement which was presented by Risden and others asking permission to lay pipes for the purpose of transmitting power by air or water to different points in the city to work elevators, hoists, machinery, etc. These are important enterprises and it is to be hoped that they will ultimately be carried out."

Locomotive Builders' Association.

There has been formed recently an association of the locomotive builders of the United States, whose constitution, adopted on the 5th of last September, we are permitted to publish, as follows:

Whereas, The locomotive building establishments of the United States, deeming it advisable for them to associate from time to time for the discussion of matters relating to general locomotive construction, and the interchange of views and information pertaining to the best and most practical methods of conducting their several works—

Now, therefore, be it known, That the locomotive builders, in convention assembled, do hereby form themselves into an association for the promotion and furtherance of these objects, and have adopted the following

CONSTITUTION.

Article I.

The name and style of the Association shall be the "Locomotive Builders' Association."

Article II.

The object of this Association shall be the diffusion of information relating to general locomotive construction, and the discussion and mutual interchange of ideas relating thereto.

Article III.

SEC. 1. The officers of the Association shall be a President, First and Second Vice-President, a Secretary and Treasurer: the offices of Secretary and Treasurer may be filled by the same person.

SEC. 2. Each officer shall hold his office for a term of one year, or until his successor is chosen.

Article IV.

SEC. 1. It shall be the duty of the President to preside at all meetings of the Association when present; to preserve order, and to see to the speedy transaction of business, and perform all other functions that properly pertain to the office.

SEC. 2. It shall be the duty of the Vice-Presidents, according to rank, to perform the duties of the President during his absence from any meeting of the Association.

SEC. 3. In case of the absence of the President and Vice-Presidents from any meeting of the Association, the members present shall elect a President *pro tempore*.

SEC. 4. It shall be the duty of the Secretary to keep a full and correct record of all transactions at the meetings of the Association, and to perform such other business as properly belongs to the office.

SEC. 5. It shall be the duty of the Treasurer to receive and take care of all moneys paid to the Association; to receive all bills against the Association, and pay the same when directed by the proper authority, taking proper vouchers for the same; to keep an accurate book account of all transactions pertaining to his office, and report the same at each regular meeting.

Article V.

SEC. 1. To become a member of this Association it is requisite that the party shall be a locomotive builder, or an active member of a firm or corporation which build locomotives; he shall receive the votes of two-thirds of all the members, and sign the constitution.

SEC. 2. Except as hereinafter provided, no establishment represented in this Association shall be entitled to more than one vote; and this vote may be cast by the member representing such establishment, or their legal representative.

SEC. 3. In all questions before the Association involving the expenditure of sums of money exceeding five hundred dollars, or a probable loss exceeding five thousand dollars to any one establishment, each establishment shall be entitled to vote according to the capacity of their works, and shall be assessed in proportion to the number of votes to which they are entitled; but no question involving such expenditure or loss shall be passed without a two-thirds vote of all the votes which can be cast by the Association.

SEC. 4. It shall be the duty of each member to report to the Secretary, at the annual meeting, the capacity of their works, and *one locomotive per month* shall be entitled to ONE VOTE on questions referred to in Section 3 of this article; voting on all such questions to be by ballot.

SEC. 5. The officers shall not incur any expense for which the Association is to be made liable, for any amount exceeding one hundred dollars, without a vote of the Association authorizing such expenditure.

SEC. 6. Each establishment shall be assessed equally to defray the general expenses incurred by the Association.

Article VI.

SEC. 1. The annual meeting of the Association shall be held on the first Thursday of September.

Regular meetings shall be held on the first Thursday of December, March and June of each year.

SEC. 2. Special meetings shall be held at the call of the President, whenever he shall be requested to do so by three or more members, ten days' notice of which shall be given; and in the call the object of the meeting shall be stated, and no other business shall be acted upon at such meeting unless three-fourths of all the members are present.

SEC. 3. An adjourned meeting may be called at any time or place that a majority of the members present at any meeting may elect.

SEC. 4. A majority of all the members of the Association shall constitute a quorum for the transaction of business, except as herein-before provided.

Article VII.

Any member giving notice of his intention to withdraw his membership, at a regular meeting, may do so at the next subsequent regular meeting, by paying all dues and assessments to the date of his withdrawal, and by giving a bond or indemnity for the payment of any liabilities incurred during his membership, as provided in Section 3 of Article 5.

Article VIII.

The articles of this Association may be amended at any regular meeting by two-thirds of all the votes which can be cast, as provided for in Section 3 of Article V.

Adopted September 5, 1872.

Proposed Consolidation of the Chicago, Burlington & Quincy and Burlington & Missouri River Companies.

The following is a copy of the circular issued to the stockholders of these companies by boards of directors of the two companies:

Your directors have long thought that for many reasons there should be a closer community of interests between the two companies, and, acting under this impression, committees of the two boards were appointed, many months since, to meet and consider of the propriety and of a basis and plan of consolidation of the stock and properties of the two corporations.

On the 3d instant, meetings of the respective boards were called and held at Boston, to hear and act upon the report of these committees, at which the matter of such consolidation, unanimously recommended by those committees, was again discussed and fully considered.

The result of those deliberations and discussions was a firm conviction in the minds of your directors that the railroads and properties of the two companies should, as soon as practicable, be placed in and put under the control of a single corporation.

Among the reasons which brought your directors to this conclusion are, that in this way the two roads could be more economically and effectively operated and managed, all possibility of conflicting interests in the future avoided, and the great through line formed by the roads of the two companies from Chicago to the Missouri River placed beyond the contingency of a disrupture.

The amount and character of the property of the respective companies was also inquired into, and after careful examination the unanimous conclusion was reached that in equalizing the value of the stock of the respective companies, it would be just and equitable to consider the value of the stock of the Burlington & Missouri River Railroad Company to be of par value, and that of the Chicago, Burlington & Quincy Railroad Company to be at a premium of 25 per cent. above its par value; this difference in the values of the two stocks to be adjusted and equalized by issuing to the holder of every share of stock in the Chicago, Burlington & Quincy Railroad Company twenty-five dollars in the 7 per cent. bonds of that company. This basis of union was accordingly agreed upon, subject to the ratification of the stockholders of the respective companies.

It was thought that the safest and most practicable mode of obtaining the object sought would presently be by a lease in perpetuity by the Burlington & Missouri River Company to the Chicago, Burlington & Quincy Company, and a sale and conveyance of the lands and other property of the former to the latter; in consideration of which the Chicago, Burlington & Quincy Railroad Company is to assume all leases, contracts and obligations of whatsoever kind, pay and discharge all debts and liabilities of the Burlington & Missouri River Railroad Company, make to the stockholders of that company the same dividends that it shall make to its own, and also secure to them the same benefits and emoluments that its own stockholders may receive or become entitled to. And your directors recommend that such, for the present, be the process for uniting the two companies.

When by legal decision or legislative action the construction to be placed on the laws of Illinois and Iowa relating to consolidation of railroad companies shall be made certain and satisfactory, it will be advisable that there should be, and it is agreed there shall be effected a complete consolidation of the two companies, share for share, or an absolute sale and conveyance of the one to the other.

As it seems to your directors to be advisable that a union of the stock and property of the two companies should be consummated, substantially on the basis and plan herein recommended, as soon as practicable, they called meetings of the stockholders of the respective companies to be convened pursuant to the notice, a copy of which is herewith enclosed; and it is hoped and believed that the stockholders will deem the matter of sufficient importance to command their prompt attention and assent, to be signified by themselves in person at such respective meetings, or by a proxy in suitable form for that purpose, to be signed and forwarded as soon as may be.

The stockholders of the Chicago, Burlington & Quincy Railroad Company are requested to send their proxies to A. T. Hall, Treasurer of that company, at Chicago, Ill.; and those of the Burlington & Missouri River Railroad Company to C. E. Perkins, Superintendent, at Burlington, Iowa.

The notice accompanying calls a meeting of the Burlington & Missouri River Company in Burlington, Iowa, December 24.

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Editorial Announcements.

Correspondence.—We cordially invite the co-operation of the railroad public in affording us the material for a thorough and worthy railroad paper. Railroad news, annual reports, notices of appointments, resignations, etc., and information concerning improvements will be gratefully received. We make it our business to inform the public concerning the progress of new lines, and are always glad to receive news of them.

Inventions.—No charge is made for publishing descriptions of what we consider important and interesting improvements in railroad machinery, rolling stock, etc.; but when engravings are necessary the inventor must supply them.

Articles.—We desire articles relating to railroads, and, if acceptable, will pay liberally for them. Articles concerning railroad management, engineering, rolling stock and machinery, by men practically acquainted with these subjects, are especially desired.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

LOCOMOTIVE ECONOMY.

All the English engineering journals have for some months past been discussing, with much earnestness, the means which should be adopted to economize fuel. Every improvement in the construction of steam engines that promises economy is carefully tried, and engineers at last have come to realize that every cubic inch of steam has an actual value quite as real as that of iron or gold. The attention called to this subject has, of course, been stimulated by the great increase in the price of coal in that country. Here, where happily no such increase has taken place, much less attention is given to the subject, excepting in a somewhat desultory way. Of course it is more important to economize coal where it is dear than where it is cheap; but its importance is only one of degree, and probably, even with cheap coal, it is much greater than is imagined by most persons who do not give it careful attention. A little consideration of the subject, therefore, probably will be profitable.

As an illustration, therefore, let us take a road whose operating expenses amount to $5,000,000 per year, which is not an unusual amount to be thus expended by one company. Of this sum, about 25 per cent. is absorbed by the expenses of motive power, and 10 per cent., or $500,000, for fuel. It will be seen, therefore, that an economy of only 1 per cent. of fuel would be equal to $5,000 per year, or a sum greater, we believe, than the salary of any master mechanic or superintendent of machinery in this country. Every man who has had any experience in the operation of railroads knows how very easy it is to make a difference of ten or twenty times this percentage by a single error of judgment in drawing conclusions from data which are often of the most complicated, obscure or subtle nature. There is a very common idea, prevalent among those who carry the money-bags which supply vitality to railroads, that the most economical man who can be placed in charge of their machinery is a hard, coarse, "practical" individual, without any of the mental discipline which a liberal education gives, or the culture which comes from an acquaintance with books and habits of study. Now it is not our intention or desire to underrate the value of the knowledge which is gained by actual experience; what we want to call attention to here is the difficulty of drawing correct inferences from the complicated data and principles involved in the operation of locomotives, excepting by the exercise of carefully disciplined thought and capacity for weighing and sifting evidence. It is a mistake to suppose that this capacity is a common one: on the contrary, it is very rare, and besides requiring certain mental qualities, it also implies the possession of moral characteristics, such as a love of truth and justice. We do not intend to assert, either, that education will supply such natural gifts as are implied by the ordinary term "common sense;" but we do believe that it cultivates a capacity for analyzing processes of thought which very few without such mental discipline ever acquire.

Now a locomotive is a very complicated machine, requiring the closest scrutiny even to observe all the phenomena evolved while in operation. The processes of combustion, evaporation and the use of steam are even now not thoroughly understood by the best trained scientific men. The conditions and nature of the chemical combinations which take place in the fire-box of a locomotive are, there is much reason for thinking, not thoroughly understood by those who have been the closest students and observers of these phenomena. The effect which the form and proportions of grates have upon the combustion of coal has, up to this time, been determined empirically, and has only to a very slight extent been the result of scientific deduction. To the form and proportions of fire-boxes perhaps as much time and thought has been given as to any other part of locomotive; but concerning the transmission of heat from the fire-box and tubes of locomotives there is little accurate knowledge existing, and we now make the tubes two inches in diameter and about ten feet long, because it is convenient to do so; but whether we would gain or lose by making them shorter or longer no one seems to know very definitely.

When we come to the smoke-box, or what locomotive runners in a sort of professional slang call the "front end," we are lost in a haze of indefinite and contradictory practices and theories; and the ideas which are held by master mechanics and locomotive runners seems to be quite as smoky and as inscrutable as the smoke-box itself. There is no subject excepting valve gear upon which an average foreman of locomotive repairs will grow dogmatic so soon and inflexibly as about "inside pipes, petticoat pipes, flared and flounced-petticoat pipes," and almost all other kinds of pipes. These are placed in every imaginable position; some extend up high and others low down; some both and others neither; smoke-boxes are partly filled with bricks, or extended out to double their usual size. Now for all these practices very few sound or satisfactory reasons are given. All that is ordinarily vouchsafed to an interested inquirer is, that John or Peter or Hank So-and-so found that his engine steamed better with the pipe high up or low down, or with mechanical adornments which, it is usually supposed, are monopolized by the other sex. What makes the subject still more confusing is the fact that our European friends carry the exhaust pipes up to the base of the smoke-stacks, while in this country the practice is almost universal to exhaust the steam at the bottom of the smoke-box.

When we come to smoke-stacks, the confusion is even greater than in the smoke-boxes. What with deflectors, cones, wire-netting, inside-pipes and outside pipes, contracted apertures and extended openings, immense receptacles for sparks and perfectly straight stacks without any room for sparks, and, quite recently, methods of conducting sparks back again to the fire-box, we are lost in a labyrinth of confusion, with no distinct theories or reason to guide us. What is quite curious, too, is that the form and proportion of stacks varies on nearly all roads, from all others, and at the same time each master mechanic will insist that his form of stack is immensely better than any other, and saves an amount of fuel the quantity of which is determined, to some extent, by the vividness of the imagination of the person who estimates the saving.

Of the quality of water to be used in locomotives, too, how very few persons who have the care of locomotives have any knowledge, excepting by the effects of the impurities upon the boilers. Those who attended the last Master Mechanics Convention, or read the reports of its proceedings, will remember the elaborate reports and discussions upon this subject, and the best means for removing such impurities. These reports and the discussion were subsequently supplemented by several letters which discussed the same question in the columns of the RAILROAD GAZETTE, and most of our readers will remember the extremely sensible suggestion made by one correspondent, that if the evils of using such impure water are so great that they might be mitigated, if not entirely remedied, by using water which was less impure; and then gave some very simple directions for determining the relative impurity of specimens of water. We do not know of a single instance of a railroad company's having the water from the different water stations along its line carefully analyzed to determine its purity. That such an investigation might result in an enormous economy a very little knowledge of the loss caused by the incrustation of boilers will show.

When we come to valve gearing, we will find the most diverse practices are followed, and that it will be utterly impossible to deduce any fixed principles from the theories and reasons which are given for this diversity. We do not know of a single railroad in this country on which the working of the valve gear of locomotives is tested with an indicator on the cylinder, which is the only certain way of determining whether the steam is used economically. "The laws which connect heat with mechanical energy," or the science of thermodynamics, requires much hard study to comprehend clearly, and in fact is not yet fully understood. It is almost impossible to comprehend what is now known of this science without a fair knowledge of mathematics. That this science is not what "practical" men sneeringly call "*theory*" is demonstrated by the fact that in some of the latest and most improved European marine engines the consumption of coal has been reduced from 40 to 50 per cent. by the application of these same principles.

In determining the value of coal for generating steam, a great deal of nice experiment and discrimination must be employed in order to determine which is the most economical. Few persons realize the difficulty of making experiments which will prove anything; and without some scientific training it is almost impossible to make that nice discrimination in the observation of facts which will take note, and estimate at their right value those things which are relevant and those which are not, to the questions at issue.

In achieving the greatest economy of operation on a railroad, or, in fact, any other large work where many men are employed, there is also another field in which quite a different kind of faculties must be exercised. We mean in the selection of the most competent men for certain work. Now in the management of locomotives the men placed on duty are beyond the observation or supervision of their employers. In employing men for these positions, therefore, it is extremely important that only such as are faithful, trustworthy, cautious and courageous should be employed. The capacity for recognizing these and other traits in men, without intimate acquaintance, is very rare. It is tolerably certain, however, that people who to a very marked extent are devoid of these same characteristics will seldom recognize them in others. There is also a feeling of confidence and personal allegiance with which some men have the power of inspiring those whom they employ, which is invaluable in positions where the most faithful service is required. No master mechanic or superintendent should disregard this. It is hard to define exactly how this power over men is acquired. Indecision is, however, fatal to it; so are incompetence, injustice and dishonesty. The exercise of a sort of respectful sympathy in the condition and welfare of the men seems to be a sure means of cultivating it. In order to acquire this power of exacting faithful service, then, a man who exercises authority must, above all things, be just and honest himself, and he must have decision and be capable of feeling and showing an interest in the welfare of his subordinates, and must understand his business.

It is, perhaps, not necessary to refer to that other—we regret to say not uncommon—cause of unfaithfulness to railroad companies, the shadow of which hangs so dark over some places, and is now so threatening to our political affairs—we mean the receiving of bribes, that poisoning of the very motives of faithful service, which is often administered so insidiously, and which paralyzes and blunts the moral perceptions and perverts the judgment. The receivers of what are euphemistically called "commissions" are described in a certain well-known old Book as "bloody men in whose hands is mischief, and their right hand is full of *bribes*." Considering the number of lives which are entrusted to the care of railroad managers, the term "bloody men" is very appropriate to those "whose hands have received bribes," and "whose eyes have been blinded therewith."

Considering, therefore, the mental and the moral qualifications which are required to operate the machinery departments of railroads with the greatest economy to their owners, it is surprising that the companies do not find it to their interest to pay higher salaries to secure the best talent in such positions. There are now many roads in this country on which the disbursements which are directed by the superintendent of machinery amount each year to from one to ten millions of dollars. In expending this money he encounters all the complicated questions to which we have referred. Without unflinching integrity and clear and accurate judgment and knowledge of human nature, he will constantly be involving his

company in expense and loss. Yet, notwithstanding this, few, if any, companies pay more than from two to three thousand dollars for the services of men to superintend these departments. The highest economy never can be achieved unless the person in charge has extraordinary abilities. He needs all that natural ability, education and scientific training and a high sense of personal honor and integrity can contribute. The disbursement of millions of dollars for railroad companies certainly requires as much talent as the expenditure and management of thousands for private enterprise; and yet those who have the care of the latter see that it is to their interest to pay more, to secure a high order of ability for their service than railroad companies are willing to give for the immensely greater service in their business.

Another evil of the low salaries is that it drives many of the ablest and most highly educated and experienced men out of such positions, and the compensations offered present no allurements for young and enterprising men to train themselves for such places. Young men of intelligence and good address can nearly always receive better pay to act as commercial travelers and present the merits of the manufacturers of flourishing establishments than they would receive if employed by a railroad company to direct the expenditures which they otherwise solicit.

When the fuel account runs up to hundreds of thousands of dollars per year, it certainly would be economy to employ a superintendent of fuel consumption who should be able to direct how to use it in the most economical way, and to pay such a man liberally to secure his services. It is quite true that many of those who are now employed in such positions are very able men, self-educated, but educated nevertheless; but then they are almost universally dissatisfied with their positions, and looking about them for other occupations.

Our plea is, that in order to secure the highest economy of locomotive service, the ablest men must be employed to superintend it, and that such should be paid more than the present salaries received for that service. In order to attract and retain younger men of thorough scientific training in such positions., higher salaries must be paid. At present the great majority of those who gain any valuable experience on railroads soon drift into the employ of manufacturing companies, firms or individuals who have more discrimination than the larger corporations. If the salaries of such officers as superintendents of machinery or chief engineers were were doubled, they would be prizes worth training for, but to ask young men to take subordinate positions and spend years in practical training for places which to them are not worth securing, is obviously absurd. The result is that educated men are rapidly being driven out or away from these places, and that those who have the requisite experience to enable them to fill them are men who have risen from the ranks, and many are sadly deficient in that scientific training which would be so valuable to them and their employers. Of course, no person with the education acquired from schools and books alone is safe or competent to fill the positions which are now occupied by self-made men, who are often very thoroughly self-educated, too. What we advocate is a large increase of salary to the present occupants of positions, so as to retain the best of them, who otherwise will in time be sure to drift off into other and more remunerative positions. While the best of them would thus be retained, others, who have the desired educational training, would be attracted into such positions.

We, of course, do not intend to undervalue the importance or ignore the necessity of practical experience to enable men to fill such places. What we are contending for is the combination of practical experience with scientific training. Of course, if these without any of the latter were in the habit of reading, there would be danger of giving offence to them, but the probability of their ever reading what we or any one else writes is so slight that we are not apprehensive that they will feel injured by our comments.

The Price of Car Service.

Car rental is a subject of some interest to the general public, at least to the New England general public, just now when people are talking of the Vermont Central's contracts with the National Dispatch Company and the Vermont Iron and Car Company. It will be remembered that the report of the trustees and managers at Boston, recently, gave the rental of the first 200 cars furnished by the National Dispatch Company as *three cents per mile*; for the next supply two and a half cents, and for those last received two cents. Some wretched grumblers who have no adequate conception of the proper reward of the genius required for the organization of a car company, and the labor and anxiety expended in getting it a contract to supply a railroad company, have taken the trouble to reckon up the probable earnings per year of a car at three cents a mile, and, finding it about enough to buy a car and a half or two cars, they have intimated in the most aggravating way that such a contract ought not to have been made by the trustees and managers.

The Belgian Government has recently made a tariff for the payment of rental for the use of the cars of private individuals, firms and companies on the railroads of the State; and this forms the basis for a somewhat extended investigation of the true value of such car service in a recent number of *Le Moniteur des Interêts Materiels*, a leading commercial journal of Belgium, a translation of which we give elsewhere. The price fixed by the Government, for open cars, usually carrying ten tons, is four centimes per *hour*. The average mileage of the Government's cars has been about 72 miles per day, and, taking as a basis the 280 francs per year which the *Moniteur* estimates as the probable receipts at this rate, we have, as the rental per mile, not three cents nor two and a half, nor even two, but almost exactly *one-fifth* of a cent. The rental of a car per year would be less than $55 at this rate. The allowance for covered cars is six centimes, and if we add one-half for such cars, the income of a car will be only about $80, and the rental per mile three-tenths of a cent. Open cars are used almost exclusively there for the transportation of most articles moved by the car-load.

The *Moniteur* contends that this rental is insufficient, that the cost of the car, including interest, etc., to the owner is something like 375 francs a year, but that an increase to something like five centimes per mile, bringing it probably to 360 francs per year, would make it for the advantage of heavy shippers to own their own cars. The average cost of cars is put at 3,000 francs, which, counting the premium on gold, is but little less than the cost of a box-car in this country, and the capacity being the same comparisons are easily made. The National Dispatch Car, carrying ten tons, is paid three, two and a half, or two cents a mile; the Belgian covered car, of similar capacity, costing probably quite as much, is paid *three-tenths of a cent* a mile—or just one-tenth as much as the highest rental of the National Dispatch cars.

It is necessary of course, in order to a fair comparison, that the other terms of the contract should be similar. But they are not; there are very important differences, chief of which is this: In Belgium *the owners and not the railroads pay for maintenance and repairs*—just the contrary of the practice here. This is a distinction with a difference, surely. Indeed, the *Moniteur* charges to maintenance two-fifths of the entire average cost of the car to the owner.

When a car is rented to a railroad company with the condition that the lessee shall pay all the expenses of maintenance and repairs, the transaction is almost exactly like lending the company the money that the cars cost—except, we may say, that car companies will exact and railroad companies pay such outrageous percentages as no lender of money would have the face to ask, and no borrower the folly to pay. The excuse sometimes offered is that the railroad company has no credit and cannot borrow money, while it can hire cars. But it is probable that a mortgage on the rolling stock so obtained would bring a loan at some rate of interest which would certainly be better than the 25, 50 or 100 per cent. that has been paid to some car companies.

Generally, it may be said, that a railroad company is not likely to profit by buying or hiring materials or stock from other corporations of numerous members, except such things as it cannot conveniently make for itself, or uses insufficiently to make it advisable to own. Whenever a company can deal with manufacturers who manage their own business and get their living out of it, it is quite probable that it can do better by buying than by manufacturing in its own shops. But to hire rolling stock of a corporation which does not manufacture, but only buys to let out for hire, is very unlikely to prove profitable—to the railroad company.

The Chicago, Burlington & Quincy and the Burlington & Missouri River.

The Chicago, Burlington & Quincy Railroad Company is likely soon to lease, and eventually become consolidated with, the Burlington & Missouri River Railroad Company (the Iowa corporation). The directors have agreed upon the terms, and a meeting of shareholders to vote on the ratification of them is to be held on the 24th of December next. As the directors control directly a very large part of the stock of the two companies, and have the confidence of the other shareholders to an extent hardly surpassed in this country, there is very little doubt that the contract will be ratified, and that the Chicago, Burlington & Quincy will assume the working of the 420 miles of road of the Iowa company next year. Adding this to the 806 miles of the Chicago, Burlington & Quincy, we have a total of 1,226 miles to be worked under one management and forming substantially one property.

It is a curious mark of the comparative prominence of what may be called speculative railroad properties, that this step, which is to make one of the most valuable and most profitable properties in the country, has scarcely attracted the slightest attention from financiers and public journals; while any change even in the management of such a road as the Erie, which for seven years past has not paid its shareholders as much as the Chicago, Burlington & Quincy divides regularly every six months, is reported at length and discussed from every possible point of view.

We give elsewhere the circular to shareholders which describes the basis of consolidation—or rather of lease, legal difficulties making the former unadvisable at present; but the arrangement is such that the shares of the two companies will share alike in the profits, whether a consolidation succeed the lease or not. To equalize the value of the shares of the two companies, a dividend of 25 per cent., *payable in the 7 per cent. bonds of the company*, is paid on the stock of the Chicago, Burlington & Quincy. It has for many years paid 10 per cent. cash dividends, with occasional stock dividends, which latter have considerably reduced the par value of the shares, which formerly, we believe, brought 165 or more, and now are worth about 135. The Burlington & Missouri River is a much younger company, whose road for the most part is through a much more thinly settled (though equally fertile) country. Still it paid last year an 8 per cent. cash dividend, and the previous year a 10 per cent. scrip dividend. It has a most promising field, which it is cultivating with great industry and skill, and there seems to be no reason why its local traffic should not eventually equal that of the Illinois road. Besides giving a direct route to Omaha, by means of branches, it gives good connections through friendly roads to St. Joseph, Atchison, Leavenworth, Kansas City and the Kansas railroads, which, now that the Chicago, Burlington & Quincy has no control of the Hannibal & St. Joseph, are especially desirable. It forms a natural part of the Chicago, Burlington & Quincy system, and, indeed, was constructed with that design. Its through traffic has always passed over that line when it could to advantage; through trains run over both lines, and the change will be one in organization rather than in working.

Bessemer Steel is now made largely in the West, Cleveland having produced for some years, and Chicago and Joliet having begun more recently. St. Louis being the center of the Western iron industry, it was proposed to establish Bessemer works there; but it is said that reports were circulated that experience with Bessemer rails had proved unfavorable and that railroad companies were likely to cease using them entirely, and this astonishing report is thought to have had some effect in discouraging the somewhat conservative capitalists of St. Louis from investing in this manufacture. Hereupon Mr. Z. S. Durfee, Secretary of the Pneumatic Steel Association (which owns the United States patent for the Bessemer process), has addressed a letter to an interested party, in which he relates the progress made in introducing Bessemer rails and the results of experience with them. Of course Mr. Durfee had an easy task. The refutation of the reports have been written for him during the past two or three years in the annual reports of nearly every company with a heavy traffic, wherein the experiences related all demonstrated beyond a doubt the vast superiority of Bessemer metal over iron in wearing qualities, and the desire was expressed, almost with unanimity, that renewals should thereafter be made with steel, until no iron rails should be left. Doubtless within a few years all the older railroads in the country which have a heavy traffic will have steel tracks throughout, and if the present high price of iron continues, steel will be the only economical metal to use on new lines, with the promise of anything more than the lightest traffic for the first seven or eight years. Hitherto we know of no new line, except the Chesapeake & Ohio, which has laid steel rails on new road; but the Canada Southern is preparing to do so, and if the production should be adequate, we think this will become a not uncommon practice.

Mr. Durfee says that two new Bessemer works are contemplated in Pittsburgh, one in the Mahoning Valley in Northwest Pennsylvania, one in the same valley near Cleveland, one by Cincinnati capitalists, and three in Indiana, including one in connection with the Indianapolis Rolling Mill.

The Locomotive Builders of this country, as will be seen by their constitution, which we publish in another column, have formed an association "for the discussion of matters relating to general locomotive construction, and the interchange of views and information pertaining to the best and most practicable methods of conducting their several works." The constitution, it will be seen, is a very simple and straightforward affair, of commendable brevity. It provides that members must be locomotive builders or active members of locomotive-building firms or corporations, that each establishment shall have one vote, except on questions involving the expenditure or loss of considerable sums of money, on which each establishment will vote according to its capacity, and that expenses shall be borne equally by the several establishments.

Doubtless by combining their resources and talents the locomotive works might make experiments and determine doubtful questions which would be too costly or difficult for any one. It is important for these works to keep abreast with all improvements, to be able to supply always the very best construction, and that at the minimum cost; else the railroad companies will build a larger proportion of their engines at their own shops. This resource of the companies, who are prepared to partly or wholly supply themselves in case of need, constitutes a peculiar competition in this manufacture. Just so soon

the builders ask a price very much greater than the cost, the older railroad companies, which have large shops and the requisite facilities, construct a larger proportion of their own engines. Should at any time the builders fail to supply carefully and accurately constructed machines, with what may be considered at that time important improvements, the companies will be sure to make locomotives in their own shops, where they can get the details and the kind of work they desire. So more than some it behooves the locomotive builders to look out sharply for all improvements, whether in the locomotive itself, or in the methods of doing work on it. They have so much at stake, and number in their ranks so many of the most skillful engineers, that they are unlikely ever to fall much behind, and very likely to be pretty well in advance.

THE NATIONAL BOARD OF TRADE, now in session in New York, has on its programme of matters to be discussed the following subjects relating to railroads and transportation: Inland Water Communication, Classification and Rates of Freight by Railroad, Transportation of Grain by Railroad and Guarantee of Weight, Local Charges on Shipping, Ocean Postal Service from New Orleans, American Shipping Interests (from the Philadelphia Board of Trade), ditto (from the Boston Board of Trade), Repeal of Tariff Duty on Railroad Iron, Ship Canal near Fort St. Philip, Harbor Improvement and Canal Construction.

FREIGHTS WESTWARD were advanced October 14 to the rates (very nearly) which went into effect March 28 last, and continued through the spring and early summer. From New York to Chicago the rates are $1.25, $1.10, 85, 65 and 50 cents, for first, second, third and fourth-class and special respectively. This is an advance of about 25 per cent. from the rates of September 2, and a return, virtually, to the rates of last spring.

GEORGE STEPHENSON is likely to have a monument in the shape of a memorial hall, at Chesterfield, England, where he lies buried.

Admission of the Cars of Private Individuals on the State Railroads of Belgium.

The following discussion of the general question of the cost of car service, which we translate from the *Moniteur des Interets Materiels* of Brussels, will be of interest to many who care nothing for this special case:

"To-day we keep the promise made to our readers of studying in detail this important reform. We will begin with the figures:

"The new decree which is to be put into force on the 1st of October next is, in appearance, only the modification of an old decree authorizing individuals to employ, *under certain conditions*, their own cars on the State's lines. But this decree, as was well remarked by M. Sainctelette during the great discussion in the Chambers, had taken the modest form of a service order which only the employees knew of, and which, moreover, had been used only in one case, for the transportation of coal for the house of Vander Elst.

"We read in it the following clause: 'No reduction on ordinary tariff rates shall be granted for transportation effected by means of this rolling stock.'

"No need was there, therefore, to give it any greater publicity. Had it been known, it would never have been used, that is evident.

"The right of using one's own cars is, in fact, only an advantage of a peculiar kind, and could be defined as the right of obtaining at all times transportation very regularly. Now this right is insignificant in ordinary times when the necessary cars can be obtained readily enough, and has a really useful effect only during a few months of the year when, as during last winter, a disastrous crisis in transportation occurs.

"But while in the commutation contract rights and charges are reciprocal, in the car-service contract the charges are all on the side of the individual and all the benefit remains with the State. Now let us see if these charges are light.

"First let us remark that they cannot fail to be permanent, a car not being—by reason of the special patterns of different companies and their administrative customs—an exchangeable matter like a truck or a boat. When certain manufacturers have unexpectedly a great deal of hauling to do, they hire or buy trucks and extra horses; they are nearly sure in advance that they can sell them again immediately and can calculate the probable depreciation in their value; with a boat it is the same; with cars it is not so, and whoever buys them in ordinary times will have to keep them or sell them for old iron.

"This being established, since a car costs to-day on an average 3,000 francs, supposing we have 20 years for wearing it out, it represents an annual charge of 225 francs, and at least 150 francs for maintenance—that makes 375 francs. This is the cost: What is the advantage?

"The cars of the State, in 1870, on the average, ran 8,750 kilometres, and carried 700 tons each. If we suppose the car loaded constantly with five tons only, to make up for returning empties and lack of utilization, it will have transported in one year 43,750 tons one kilometre. If it is necessary to pay 375 francs for the right of transporting this tonnage in one's own cars, by this the cost of transportation is augmented at the rate of 8-10ths of a centime per ton per kilometre. A considerable capital is sunk, risks are increased, and in exchange there is obtained only very nearly the same result that would be obtained by a commutation contract.

"It would therefore have been as well to suppress this right and say that the aid of individuals was not desired. But it was not done, as there were no good reasons to give.

"The question then was remitted for consideration, and last January M. Moncheur announced in the Chambers that the administration would see if means could not be found to grant a reduction of rates, at the same time that a less onerous service was demanded of the railroads.

"The decree of the 10th of September, 1872, brings us the results of this consideration, and we are glad to see that the principle of remuneration has been admitted. The eloquence of M. Sainctelette probably has not been unconnected with this result.

"The State grants, as rental, for all the time the cars remain upon its lines, together with the regulation time for loading and unloading, .04 francs per car per hour for open cars, and .06 francs for covered cars. We will only consider the first, which are almost exclusively employed for the transportation of bulky freight.

"This payment would be equivalent to 340 francs per year, if loading and unloading could always be done in the regulation time, if not a minute should be lost, and there be not an instant's delay. It would be proper, however, to deduct two or three weeks a year for repairs, say 20 francs; 10 per cent. of the remainder, or 32 francs, for time spent in waiting, 8 francs for miscellaneous expenses; and the sum is reduced to 280 francs, which is practically the maximum that an individual can expect from the rent of his car to the State.

"We have seen that the car costs him at least 375 francs. The remuneration then is not sufficient.

"Could the State offer more, and does this payment of .04 francs represent the equivalent of the benefits that it obtains by this arrangement?

"In the first place, the railroad companies among themselves pay each other three francs a day for the cars that they borrow, but as to this arrangement it may be responded that its effect is destroyed by the reciprocity, we will try to estimate directly what the State gains by employing the rolling stock of individuals.

"Incontestably the cost of maintaining this rolling stock. But what does the maintenance of its own cars cost the State? That is what it is impossible to find in the long report of the administration. We are then forced to take as a basis the expenses of the Grand Central, evidently inferior to those of the State, which will consequently be still more favorable to it in our calculation.

"The maintenance of a car costs about 147 francs; allowing 13 francs for lubrication, etc., and it is in all 160 francs.

"This incontestable benefit would be the only one that could be estimated if the State, having no need for this material, in order to employ it had to leave in reserve a part of its own stock. But, alas! we know this is not so, that probably it never will be so, and that the present decree has no other aim than to avoid as much as possible and indirectly an insufficiency, the source of a thousand complaints.

"It is proper, therefore, to add to the figures for the maintenance the interest and the depreciation of the car which the State would have had to acquire in the place of this. Suppose that the State obtains this material on better terms and profits by a better condition of credit, still we could not estimate the annual charge at less than 200 francs.

"The State, then, while reserving all the indirect benefits, which are considerable—the increase of its stock, the diminution of its shops, the formation of regular trains, the better utilization of the material, rapid loading and unloading, etc., etc.—reserving all these advantages it could and ought to establish its basis in such a way that an active manufacturer could receive about 360 francs from the rent of his cars to the State. Four centimes is not sufficient; perhaps five centimes would be.

"We have proved that the State could do it; it is only too easy to prove that it ought to. For it chiefly and continually this measure will profit. This we will explain in the next number, in considering the consequences of this new policy."

TRAFFIC AND EARNINGS.

—The earnings of the Toledo, Wabash & Western Railway for the month of September were: 1872, $565,811; 1871, $558,817; increase, $6,994, or 1¼ per cent.

—The earnings of the Missouri, Kansas & Texas Railway for the month of September were: 1872, $202,000; 1871, $98,110; increase, $103,890, or 105⅝ per cent.

—The earnings of the Erie Railway for the month of September were: 1872, $1,643,464; 1871, $1,899,395; decrease, $255,931, or 13½ per cent.

—The earnings of the Union Pacific Railroad for the month of August, were as follows:

	1872.	1871.
Earnings	$789,567 56	$681,865 83
Expenses	358,595 52	299,624 74
Net Earnings	$431,042 04	$382,241 09

The increase in the gross earnings was $107,701.73, or 15¾ per cent., and in the net earnings, $48,800.95, or 12¾ per cent.

—The earnings of the Des Moines Valley Railroad for the nine months from January 1 to September 30 were: 1872, $577,160; 1871, $565,781; increase, $11,379, or 2 per cent.

—The earnings of the Hannibal & St. Joseph Railroad for the month of August were: 1872, $199,439; 1871, $291,815; decrease, $92,376, or 31¾ per cent.

—The earnings of the St. Louis & Southeastern Railway (consolidated) for the month of September were $100,272.

—The earnings of the St. Louis & Iron Mountain Railroad for the first week in October were: 1872, $55,878; 1871, $43,972; increase, $11,906, or 27¼ per cent.

—Three hundred and ninety-three cars of live stock were shipped east by the Vandalia route from East St. Louis stock yards during the month of September.

—The following railroads report earnings for September as follows:

	1872.	1871.	Increase.	Decrease.	P.ct.
Bur., Ced. R. & Minn.	$113,834	$95,623	$18,211	....	19
Clev., Col., C. & Ind.	419,439	385,381	34,158	....	8⅞
Des Moines Valley.	83,063	81,924	1,139	....	1⅜
Erie	1,643,464	1,794,397	....	150,933	8⅜
Ind., Bloom. & W...	124,203	100,154	24,049	....	24
Kansas Pacific	341,968	368,328	....	26,360	7⅛
Lake S. & Mich. So.	1,587,869	1,368,948	218,921	....	16
Mil. & St. Paul	811,961	815,345	....	3,384	0⅜
St. L., Al. & T. H...	177,429	188,443	....	11,013	5⅞
St. Louis & I. Mo'n.	194,000	141,165	52,835	....	37½
Tol., Wabash & W..	565,811	558,817	6,994	....	1¼

General Railroad News.

PERSONAL.

—At a public dinner given at the Iyanough House, Taunton, Mass., in honor of the Union of the Old Colony and Cape Cod railroads, Mr. Winslow, the retiring Superintendent of the Cape Cod road, was presented with a silver service valued at $1,000.

—General Thomas A. Morris has resigned his position of Receiver of the Indianapolis, Cincinnati & Lafayette Railroad, to take effect on the 1st proximo.

—Mr. George Stevens, Master Mechanic of the Houston & Texas Central Railroad, and formerly Master Mechanic of the Boston, Coucord and Montreal Railroad, died last week at Houston, Texas.

—Mr. Charles W. Douglas, who lately resigned his position as Superintendent of the South Side Railroad of Long Island to accept an appointment as Superintendent of the New York & Oswego Midland Railroad, was made the recipient of some very handsome presents at Brooklyn, last week, by the officers and employees of the South Side road. Mr. Douglas commenced his railroad service as a telegraph operator on the Erie Railway, and was Superintendent of the Delaware Division of that road for several years before going to the South Side.

ELECTIONS AND APPOINTMENTS.

—Nathan Guilford has been appointed General Freight Agent of the Baltimore & Ohio Railroad Company, in place of George R. Blanchard, who has lately accepted a similar position on the Erie Railway.

—George B. Spriggs has been appointed General Freight Agent of the Baltimore & Ohio Railroad at Columbus, Ohio. All freight agents on the Ohio Divisions will report to him on all matters connected with the department.

—Mr. E. P. Hill, formerly of Dunkirk, N. Y., has been appointed Assistant Superintendent of Rolling Stock of the Erie Railway.

—Major M. R. Baldwin has been appointed Superintendent of the Houston & Texas Central Railroad, with headquarters at Houston, Texas. Major Baldwin was formerly Superintendent of the Leavenworth, Lawrence & Galveston Railroad.

—Mr. S. G. Eddy has been appointed Superintendent of the Choctaw Division of the Missouri, Kanas & Texas Railway.

—Mr. J. M. Lunt, who resigned his position as Superintendent of the Maine Central Railroad, October 1, has, it is reported, been offered the position of Superintendent of the Boston, Hartford & Erie road, and also that of General Superintendent of the Iowa Central road.

—Charles H. Ellis, formerly Chief Engineer of the Vermont & Massachusetts Railroad, has been appointed Chief Engineer of the Washington & Point Lookout Railroad.

—Mr. M. C. Conwell, of Dover, Del., has been appointed Superintendent of the Wilmington & Western Railroad.

—At the annual meeting of the Horn Pond Railroad Company at Boston, October 7, H. O. Bright was elected President and T. J. Peirce, C. O. Gage, T. Hall and N. Bartlett directors. The road, which is principally used for transporting ice, is operated by the Boston & Lowell Company.

—T. A. Bissell, for 14 years connected with the Chicago, Burlington & Quincy Railroad as draftsman, has been appointed Superintendent of the Pullman car shops in Detroit, under C. F. Allen, General Manager of shops for the Pullman Company, who was himself long engaged in the Chicago, Burlington & Quincy shops at Aurora.

—Mr. H. M. Kinsley, of Chicago, a famous caterer, who had charge, at one time, of the Pullman dining-cars, has been appointed to take charge of the hotels and eating-houses of the Baltimore & Ohio Railroad. Just now he is furnishing the great hotel at Cumberland.

—At an adjourned meeting of the Louisville, Cincinnati & Lexington Railroad Company, held in Louisville, October 1, the following directors were chosen for the ensuing year: Joshua F. Speed, J. Guthrie Coke, T. L. Barrett, T. L. Jefferson, Jilson P. Johnson, Joseph T. Tompkins, E. D. Standiford, Lyttleton Cooke, Louisville, Ky.; E. D. Sayre, M. C. Johnson, Henry Pell, W. C. P. Breckenridge, Lexington, Ky. Norvin Green, of Louisville, was re-elected President; Joshua F. Speed, Vice-President; R. H. Courtney, Secretary and Treasurer. Of the directors, Messrs. Barrett, Jefferson, Jilson P. Johnson, Breckenridge and Tompkins are new ones, succeeding J. B. Wilder, J. M. Monahan, J. W. Kalfus, R. Ferguson, of Louisville, and James O. Harrison, of Lexington. Messrs. Standiford and Cooke are the State directors. The Superintendent, Mr. J. E. Gimperling, has resigned, but his successor is not yet appointed.

—The following are the officers of the Memphis & Northwestern Railroad Company: R. D. Hartshorne, President, Thayer, Kan.; F. C. Dodd, Vice-President, Altoona, Kan.; C. T. Ewing, Treasurer, Thayer, Kan.; J. M. Ritchey, Secretary, Ritchey, Mo.; J. W. Otley, Chief Engineer, Des Moines, Iowa; W. F. Bruff, Financial Director, London, England; H. D. Faulkner, Fiscal Agent, New York.

—At the annual meeting of the stockholders of the Rockford, Rock Island & St. Louis Railroad Company, at Rock Island, Ill., October 9, the four directors whose term of office expired, were re-elected. At a subsequent meeting of the board of directors, all the old officers were re-elected.

—At the annual meeting of the stockholders of the Ohio & Mississippi Railroad Company, at Cincinnati, October 10, S. W. F. Odell, of New York; Lewis B. Parsons, of St. Louis, and James D. Lehmer, of Cincinnati, whose terms had expired, were re-elected directors. At a subsequent meeting of the board of directors, Daniel Torrance, of New York, was re-elected President, and A. N. Chrystie, of St. Louis, Vice-President.

—At the annual meeting of the stockholders of the Wolfborough Railroad Company, at Wolfborough, N. H., October 8, the following board of directors was chosen: Thornton K. Lothrop, of Boston; Benjamin F. Reed, of Boston; George M. Burleigh, of Great Falls; John M. Brackett, of Wolfborough; John W. Sanborn, of Wakefield; Charles W. Thurston, of Wolfborough; Joseph L. Avery, of Wolfborough. At a subsequent meeting of the directors, T. K. Lothrop, of Boston, and President of the Eastern Railroad, was chosen President, and John L. Peavey, of Wolfborough, Clerk. The road, which was completed in August last, is leased by the Eastern Railroad Company.

—Mr. J. H. Lukens, of Burlington, N. J., has been appointed Assistant Engineer of Maintenance of Way on the Amboy Division of the Pennsylvania Railroad, in place of J. W. Allen, resigned.

—Mr. T. W. Spencer, Chief Engineer of the Utica & Black River Railroad, has been appointed Superintendent of that road and will hereafter hold both offices.

—At a meeting of the stockholders of the New Jersey Southern Railroad Company October 9, the following directors were chosen: Jay Gould, Walter B. Palmer, John H. Bacon, Jr., C J. Osborn, Henry H. Martin, John F. Cole, O. W. Joslyn, G W. Bentley, Ashbel Green, B. Williamson, R. F. Stockton, War

ren Leland, John B. Morris. Jay Gould is President of the company. Messrs. Green, Williamson and Bentley (the present General Manager) are the only members of the old board who are re-elected. Most of the new directors are property owners at Long Branch.

—At a meeting of the new board of directors of the Cincinnati & Great Northern Railroad Company, held at Dayton, Ohio, Hon. J. C. McKeemy was elected President of the board; W. A. Weston, of Greenville, Ohio, Secretary; and James T. Brady, of Pittsburgh, Pa., Treasurer.

—At a meeting of the stockholders of the Hannibal & Naples Railroad Company, held at Springfield, Ill., October 5, the following board of directors was elected: A. Boody, A. B. Baylis, A. M. White, George Cecil, New York; C. M. Smith, Springfield; Josiah Hunt, J. H. McVeigh, Hannibal; C. L. Higbee, Pittsfield; J. N. Drummond, Toledo. The board elected the following officers: C. M. Smith, President; W. B. Corneau, Secretary and Treasurer. Messrs. Boody, Baylis, White, Cecil and Corneau are officers or directors of the Toledo, Wabash & Western Company, which leases the Hannibal & Naples road.

—C. M. Shephard has been appointed Assistant Superintendent of the Gilman, Clinton & Springfield Railroad. He has been Master of Transportation on the road for some time.

MISCELLANEOUS.

—A short time ago a brakeman on the Chicago, Burlington & Quincy Railroad was standing on a freight car and holding by the brake when the brake wheel broke lose and caused him to fall between the cars. He continued to hold by the brake rod, which bent down gradually nearly to the ground, but clear of the cars, when he dropped it and fell to the ground very little hurt.

CHICAGO RAILROAD NEWS.

Illinois Central.

The company reports as follows its receipts for September, 1872:

Land Department.

Acres construction land sold	1,388.30	for	$10,812.13
Acres interest fund lands sold	80	for	432.00
Acres free lands sold	...	for	....
Total sales during the month of Sept., 1872	1,468.30	for	$11,244.13
To which add town lot sales			
Total of all	1,468.30	for	$11,244.13
Cash collected in September, 1872			$45,221.76

Estimated Earnings—Transportation Department.

	In Illinois. 707 Miles.	In Iowa. 402 Miles.	Total. 1,109 Miles.
Freight	$375,256.00	$104,265.00	$479,521.00
Passengers	127,394.50	47,751.55	175,046.05
Mails	6,375.00	3,059.33	9,434.33
Other sources	93,615.00	2,240.67	95,965.67
Total, September, 1872	$602,550.50	$157,416.55	$759,967.05
Total actual earnings, Sept., '71	729,076.88	161,210.42	890,287.30
Decrease	$126,526.38	$3,793.87	$130,320.25

This is a decrease of 21 per cent. in the Illinois earnings, 2⅓ per cent in the Iowa earnings, and 14⅔ per cent. in the total earnings.

Michigan Central.

About 80 miles of new track has been laid down on this road during the season. The company has just ordered ten additional locomotives. A proposition was made some time since by Mr. Joy, President of this company, offering the privilege of running the passenger trains of the Pennsylvania roads into the Michigan Central depot on the lake shore. Since that time, the Pennsylvania Company has been considering the subject of building a first-class passenger and freight house on the west side of the river, extending from Madison to Van Buren streets. Owing to the crowded state of the West Division, it is supposed that the company may yet accept Mr. Joy's proposition, and build the proposed new building to accommodate the freight business alone.

This company will move its general offices into the new building, near the head of South Water street, within about 30 days. The building occupies the old site, a portion of the front wall of the building being incorporated into the new building. Some improvements have been introduced into the reconstructed building, which will make it one of the best buildings of its kind in the city.

Chicago, Burlington & Quincy.

At the last meeting of the directors of this road, a resolution was adopted to call a meeting of the stockholders in December next to consider the question of consolidation of the Chicago, Burlington & Quincy with the Burlington & Missouri River Company, and it is believed to be quite probable that such a consolidation will take place.

The second track is now completed between Chicago and Aurora, construction trains having passed over the entire line. It will be opened for business about the 20th inst.

A new station has been established between Biggsville and Sagetown, about 12 miles east of Burlington. It is called "Ward's."

Chicago & Northwestern.

The President of this company and other executive officers have been making arrangements for the commencement of work upon the new car and machine shops which are to be built just west of the city. An appropriation of one million dollars has been made toward the construction of these shops, and the foundations of the building are to be laid this fall.

Trains are to be run from Chicago to St. Paul over this road, by way of the West Wisconsin road and the Madison Extension, by the 15th of November. The Madison Extension is completed to Elroy, where the West Wisconsin will join it.

This company, with the help of considerable local aid, is constructing a branch from Geneva south to Batavia, down the west bank of Fox River, and for the most part very near the stream. About a mile of the road-bed is now completed, and the contractor, Mr. L. P. Barker, of Geneva, is working with 60 men and 30 teams. It is intended to have the cars running before the end of the year. Then Batavia will have three stations at which cars may be taken for Chicago, the Chicago, Burlington & Quincy having one on the east side and one on the west side, both on the high banks, at some distance from the river, while the Northwestern's will be, we understand, much lower down, and very little above the level of the great stone quarries, so that stone can be put into its cars with very little hauling and that not much up hill.

Milwaukee & St. Paul.

The section of road which is to connect Milwaukee and Chicago has been completed 47 miles, or to a point nearly west of Waukegan. There are 36 miles more to be laid, and as the work is progressing at the rate of a mile of track per day, it is pretty certain that the road will have its trains running to Chicago about the last week in November. The section of road between Winona and La Crosse will be finished within ten days.

Chicago, Danville & Vincennes.

A conference between the officials of this road and the Railroad Committee of the Common Council has resulted in an adjustment of the difficulty spoken of last week, and the company are permitted to proceed with their tracklaying substantially as they had commenced.

The company are negotiating for ground for car shops, round house, etc., near the intersection of their road with the Chicago & Alton road.

Chicago, Decatur & St. Louis.

This company has suspended operations for want of funds, and will not resume probably until spring. The bonds of the road are in process of negotiation at present, and when they are sold there will be money enough to complete the road. A large amount of grading has been done during the summer, and when work is resumed it will be pushed to rapid completion.

Chicago, Rock Island & Pacific.

The business of the Chicago & Southwestern Branch is slowly but surely improving in all its departments. At a meeting of the stockholders of the company, recently, the following-named officers were elected, viz.: John F. Tracy, President; James N. Burns, Vice-President; H. M. Allen, Secretary; F. H. Tows, Treasurer.

Trains commenced crossing over the new bridge at Rock Island, October 7, the first passenger train passing over on the morning of that day. The old bridge is no longer to be used and will be shortly torn down.

Chicago & Illinois River.

This company, whose track is to bisect that region of country lying between Chicago and Joliet, and between the Rock Island & Pacific track on one side, and the Chicago & Alton on the other, is surveying its line just outside the city limits, and this has caused considerable activity in speculation and purchases. If this company do as the Chicago & Pacific Company did, that is, buy large tracts of land along their line, and where the passenger stations are to be, there is no reason why it should not be able to save a considerable portion of the expense of construction from the enhanced value of land near the city limits.

Chicago River Bridges.

Eight of the city's drawbridges over the Chicago River, three wooden and five combination, were destroyed by the fire a year ago. These have been replaced by one wooden, one combination and five iron structures. The *Tribune* gives the following tabular statement of the kind and cost of the several bridges:

Bridge.	Description.	Cost.
Clark street	Howe truss	$32,000 00
State street	Keystone iron	42,967 81
Rush street	Iron	28,360 00
Wells street	Iron	30,164 95
Chicago avenue	Iron	29,850 00
Adams street	Keystone iron	45,154 28
Van Buren street	Combination	13,240 00
Polk street	Iron	36,595 00
Total		$250,332 13

Freight Rates.

The rates have been raised on both east-bound and west-bound freights between Chicago and the Atlantic. The advanced rates went into force on Monday, the 14th inst. They are five cents advance on grain and fourth-class freight, and ten cents on flour. West-bound freights have advanced about 25 per cent. The rate on first-class goods is $1.25 per hundred, and on the special class, which includes sugars and heavy groceries, the rate is fifty cents per hundred.

THE SCRAP HEAP.

No One or No. One.

The Chicago *Tribune* says: "The other day, the busy Liberal candidate for gubernatorial honors in Indiana found it necessary in his canvass to ask by telegraph to a head railroad official that a train might take him up at a small station. The answer promptly came back, '*No one will stop for you.*' Hendricks and his friends waxed exceeding wroth, as at a decided snub, and made a change in their railroad programme. But the courteous official had really done all in his power by promising that train number one would meet the request made. Hendricks will next time know how to 'look out for number one'—rarely a lack in a politician."

Novel Railroad Accident.

The San Jose (Cal.) *Mercury* gives the following ludicrous account of a railroad accident near Mountain View, in that State: "A farmer in that vicinity had been out with his team gathering up a lot of telegraph wire, to be used in repairing his fences. This wire, of which there was a large quantity, he coiled and banded up as well as he was able, and loaded it on his wagon. Thus, partly hauling and partly 'snaking' his load, he proceeded toward home. His route lay across the railroad track, and it so happened that the down train was in sight, but having ample time he drove across the track and at the distance of about a hundred feet halted to see the train pass. Now it so happened that one line of the wire which was dragging behind had caught on a spike at the crossing, and, being loosely coiled, it payed itself out without attracting the attention of the farmer. When the engine struck it, however, he was forcibly reminded of its existence. His load began to string out for a moment, then a vagabond wire twisted round one of the bolsters, then came a sudden yank, as wagon and team, man and all, commenced a rapid crawfish movement toward the track. The engineer whistled down brakes, the levers were turned with a will and the train stopped just as the wagon was about to be drawn under its wheels; but not before the wire had become almost inextricably wound up and entangled in the trucks and brakes. When that wire came off from the train, it was in pieces very unsuitable for fence-building. No one was hurt, but the remarks of the train-men can be imagined, as can also the astonishment of the passengers, who saw a two-horse team going backward at a terrific rate, without any visible cause."

Railroad Manufactures.

The great rolling mills of the Cambria Iron Works, in Johnstown, Pa., caught fire on the night of the 12th of October, and only a portion of the main building and west wing were saved. The light machinery was entirely destroyed; the heavy machinery not much damaged. Work began almost immediately on a temporary roof, under which it is expected to have the machinery replaced and running before the end of the month. It is reported that the loss is $400,000 and the insurance $100,000. The steel works and furnaces were uninjured. At this time especially, when all mills are crowded with orders and it is difficult to get rails for immediate delivery, this fire will be felt as an injury to the railroads as well as to the Cambria Works.

New car works in La Porte, Ind., are now in full operation.

The Decatur (Ill.) Rolling Mill, having but fairly started, was obliged to stop running one day recently, so many of the workmen had the ague.

A company has been organized to engage in the business of building railroad cars at Jacksonville, Ill. Nearly all the stock has been subscribed for and work is to be commenced on the buildings very soon.

The Midland Car Manufacturing Company have completed and shipped to Mirimichi and Campbelltown, New Brunswick, the first order of 100 flat cars for the Intercolonial Railway.

On the morning of the 16th of October, the Vulcan Rolling Mills in Cincinnati were totally destroyed by fire, causing a loss of about $75,000, on which there is no insurance.

On the afternoon of the 16th, the large rolling mill of Cooper, Hewitt & Co., in South Trenton, N. J., was partly destroyed by fire. The loss is estimated at $70,000, and 600 men are temporarily deprived of work.

The Winans Cigar Steamship.

The Acting Commissioner of Patents has granted the application of Ross Winans and Thomas Winans, of Baltimore, for an extension of their patent for a new style of hulls for steam vessels, being what is commonly known as the cigar-shaped vessels, or "cigar steamers." It was shown in evidence that the Messrs. Winans, in attempting to demonstrate the practical utility of their invention, have expended over $1,000,000, without receiving a cent of remuneration. They have built one cigar-shaped vessel in Baltimore, two in England, and one in Russia.

Iron Production in 1870.

The returns of the census of 1870, recently published, give the following statistics of iron production in the United States for the year ending June 30, 1870:

Pig Iron—386 establishments, 574 blast furnaces (with a daily capacity of 8,357 tons melted metal), employing 27,554 hands, producing 2,052,821 tons of pig, of the value of $69,640,498.

Bloomary Forges—82, employing 2,902 hands, producing 110,808 tons of blooms, of the value of $2,765,623.

Foundries—2,653, employing 51,297 hands and producing to the value of $99,837,218.

Forges—102, employing 3,561 hands and producing to the value of $8,147,669.

Establishments producing bar, rod and railroad iron, nail, plate, &c.—369, employing 44,643 hands and producing to the value of $120,301,158.

OLD AND NEW ROADS.

Hannibal & Naples.

At the meeting of the stockholders of this company, held at Springfield, Ill., October 5, the lease of the road to the Toledo, Wabash & Western Company and the lease of the Hannibal Bridge were ratified and confirmed by the stockholders.

Allerton & Des Moines

A company by this name has been organized to build a road from a point in Wayne County, Iowa, on the Missouri State line, by way of Allerton to Des Moines. This road would run nearly due north from Allerton and would be about 75 miles long. The capital stock is to be $3,000,000, in shares of $100 each.

Clarksville & Western.

The work on this Missouri road is being pushed forward, and the grading parties expect to reach St. Peters, on the St. Louis, Kansas City & Northern road, by the middle of November.

St. Louis & Keokuk.

The work on this road in St. Charles County, Mo., has been suspended for the present, but it is expected that it will be renewed very shortly.

Pittsburgh, Cincinnati & St. Louis.

An application has been received by the Committee on Stock List of the New York Stock Exchange from the Pittsburgh, Cincinnati & St. Louis Railway Company to have its securities placed "on call." The following official statement has been submitted:

"The company was organized May 1, 1868, by the consolidation of the Steubenville & Indiana Railroad Company, the Holidays Cove Railway Company, and the Panhandle Railroad Company, under the laws of the States of Ohio, West Virginia and Pennsylvania. Length of road from Birmingham, opposite Pittsburgh, to Newark, Ohio, 159 miles; one-half interest in Central Ohio Railroad, from Columbus to Newark, Ohio, 33 miles; branch from Cadiz Junction to Cadiz, Ohio, 8 miles. Total, 200 miles. Capital stock, 200,000 shares of $50 each. Of which 60,000 was preferred seven per cent. stock, and 140,000 shares common stock. There are also in the hands of the company 75,000 shares preferred stock, created by special action of the shareholders at their annual meeting February 5, 1872. Of this 70,000 shares preferred stock 60,000 shares are to be issued to the Pennsylvania Railroad Company at par for payment of that amount borrowed of that company for the purpose of improving and further equipping the road, leaving to be hereafter issued as occasion may require 10,000 shares. The funded debt of the company is: First-mortgage consolidated 7 per cent. bonds, dated August 1, 1868; maturing August 1, 1900, interest payable February 1 and August 1 at the office of the Pennsylvania Railroad Company in Philadelphia—$10,000,000. Denomination, $1,000 each. First mortgage six per cent. bonds, dated May 1, 1864, maturing May 1, 1884, interest payable monthly, according to series (of which there are 12), at the agency of the company in New York, $3,000,000, denomination $1,000 each; first mortgage 7 per cent. bonds, dated Sept. 1, 1864, maturing Jan. 1, 1890, interest payable Jan. 1 and July 1, at the office of the Pennsylvania Railroad Company, in Philadelphia, $775,000, denomination, $1,000 each. The company has an additional debt, incurred for equipment, double track, extension of side tracks, depots, shops and other improvements, amounting to $3,925,971.56. Of this debt $3,049,893.21 are held by the Pennsylvania Railroad Company ($3,000,000 of which, as already stated, is payable in preferred stock at par, and the remainder in income bonds of the Columbus, Chicago & Indiana Central Railroad Company at par), and $876,078.35 are held by the Pennsylvania Company. To meet this debt the company holds securities to the amount of $4,104,000.

"The following roads are leased by this company, viz.: Chartiers Railway, 23 miles; Little Miami, Columbus & Xenia Railroad, 197 miles; Columbus, Chicago & Indiana Central Railway, 587; Jefferson, Madison & Indianapolis Railroad, 210; St. Louis, Vandalia & Terre Haute Railroad, 165. Total 1,189 miles."

Peoria, Atlanta & Decatur.

Much dissatisfaction is expressed by the people along the line with the inactivity of the present management. It is believed that the road will not be built unless the board of directors can be changed.

Maine Central.

The new track from Waterville to the Kennebec River having been completed, the old track from Kennebec Mills to Waterville has been taken up, and all trains will be run over the new line.

Concord & Portsmouth.

The New Hampshire Railroad Commissioners were to meet at Epping, N. H., this week to arrange for the intersection of the Portland & Rochester with the Concord & Portsmouth Railroad at that place. The opening of this road will afford to the Portsmouth people a new route to New York, by way of Nashua and Worcester. It is said that when this route is completed the Boston & Maine road will seek to build a short link

between Madbury and Dover, with a view of directing the eastern travel over their road to Portland, instead of by way of Rochester.

New Jersey Southern.

It is said this company are about to build a branch or loop line from Long Branch through Cedar Grove and Shark River, rejoining the main line at Farmingdale. This branch would be about 13 miles long, and would be valuable chiefly for summer travel.

Vicksburg & Canton.

The contract for the construction of this railroad from Canton, Miss., southeast to Vicksburg, a distance of 55 miles, has been let to the Wheeler Construction Company of Illinois. Work is to be begun at Canton next month and at Vicksburg early in the spring.

San Diego & San Bernardino.

A contract has been let for the construction of ten miles of this road from San Diego, Cal., northward.

Springfield & Northwestern.

It is reported that the Toledo, Wabash & Western Company has under consideration the purchase of this road. This road is now in operation from Havana, Ill., to Petersburg, and is under construction from Petersburg to Springfield.

Alabama & Chattanooga.

The Chattanooga *Times*, of October 7, speaks as follows of the settlement of the difficulties with the State of Georgia, concerning that part of the road which is in that State :

"We are happy to announce that Hon. Dan. S. Printup succeeded, on Thursday, in effecting an arrangement with Governor Smith, so that from this time forward trains will run regularly on the Alabama & Chattanooga Railroad. The contract has been signed by both parties, and a train went out yesterday as far as Attalla, taking the officers of the road and a number of invited guests.

"We understand that the contract simply concedes to the receivers peaceable possession and operation of the road, while they recognize Georgia's rights under the statutes of Georgia, and agree, at the demand of Governor Smith, to restore the road in Georgia to its present status.

"We do not think it possible that any such demand will be made, as Governor Smith manifested in the negotiations a very generous spirit, seemed disposed to assist the receivers and benefit the public so far as it was possible to do without compromising the rights of the State, which he has so resolutely maintained."

Oregon Central.

This road is now complete to Gaston, in Yamhill County, about 30 miles from Portland and ten miles beyond the Tualatin River, which point was the end of the track at last accounts.

Denver & Platte Valley.

The Denver (Colorado) *News* says :

"It so happens that the Denver Pacific is not run in the interest of the Union Pacific road—the causes of which need not now be discussed—and the latter company therefore proposed to build a branch line from Julesburg up the Platte to Greeley and Evans, and thence by way of the valleys of the Big Thompson, St. Vrain and Boulder, and Golden City to Denver; thus reaching our city by a somewhat circuitous route, but one through a rich and productive country. Arrangements for this enterprise having been inaugurated, up pops a new railway corporation, calling itself the Denver & Platte Valley Railway Company, which proposes to construct a line from Denver to Fort Morgan, a distance of ninety miles, and demands from Arapahoe County $300,000 to assist in the undertaking. Now this was asking the people to aid in constructing a road parallel for fifty miles with one in which they already owned one-fourth interest, and almost parallel with the Julesburg line for forty miles more; and furthermore to increase their debt, and add $24,000 to their annual taxes. That the construction of this line would render worthless the county stock in the Denver Pacific was a fact recognized from the start. The County Commissioners, however, were petitioned to order a special election; the election was ordered, and the proposition placed officially before the public. Then the Denver Pacific directors, whose road would be injured by the voting of the new bonds, offer to allow the Julesburg line to run its trains into Denver on the Denver Pacific track from the point of intersection at or near Evans. The President of the company, Mr. Carr, was authorized to enter into negotiations with the Union Pacific for the consummation of this proposition. There is no 'if possible' about the matter, as one of our correspondents yesterday intimated, unless the Union Pacific wish to raise one. If that company are anxious to run their trains into Denver, the Denver Pacific track between Evans and this city is open to them. If Mr. Carr and Mr. Sickles cannot agree upon the terms, the question goes to a committee of railroad experts, whose decision in the matter shall be final."

Ware River.

The directors of this company propose to raise funds to complete the road from Gilbertville to Winchendon by issuing second-mortgage bonds to the amount of $250,000, to be apportioned among the present bondholders. The length of road to be built is about 34 miles.

Boston & Providence.

It is said that this company, having bought the Stoughton Branch road, propose to extend it from Stoughton east to North Bridgewater, Mass., about five miles.

Danielsonville & Brooklyn.

Surveys are being made for a railroad from Danielsonville and Brooklyn, Conn. The road will be about four miles long, and will be a branch of the Norwich & Worcester road.

Oregon & California.

The Sacramento (Cal.) *Union* says : "The Oregon & California Railroad is in operation as far as Roseburg. This town of several hundred inhabitants is two hundred miles south of Portland, and situated at the junction of Deer Creek with the South Umpqua River. It is in the heart of the Umpqua Valley—one of the richest agricultural districts of the Pacific coast. The Umpqua River has its source by two principal tributaries in the Cascade Mountains (continuation of the Sierras); these, flowing westerly, unite before entering the Coast Range, and break through the rugged and heavily-timbered country to the ocean, forming a deep gorge and a channel too rough, in its natural condition, for navigation. Along these streams and their numerous branches are many fertile valleys, designated the Umpqua Valley. This valley is separated from the Willamette by the Calapoola Mountains, and some sixty miles southward another chain intervenes between the Umpqua and the Rogue River Valley. It embraces several thousand square miles well supplied with timber and water. Besides its agricultural advantages, it is rich in minerals and affords a fine field for stock raising.

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As there is a natural pass through the Calapoola Mountains, the railroad has so far met with no serious obstacles to its construction. For some miles south of the present terminus the route is favorable, but before entering the Rogue River valley, a wide stretch of mountainous country must be traversed. After passing the valley of the Rogue River—a tract of country somewhat less in extent than the Umpqua, but comprising much excellent land and possessing a fine climate—the greatest difficulty in the way of connecting this State with Oregon by rail is presented by the Siskiyou Mountains. A direct road, it is said, would require a long and expensive tunnel. The probability is that the road will pass around by the way of Klamath Lake. As the road on this end is completed to near Shasta, staging between San Francisco and Portland is reduced to two days, and the entire distance can be made in about three days. When the road is opened throughout, aside from its advantages in a business point of view, the scenery up the Sacramento river, about Mount Shasta, the mountains beyond and through Oregon, will make a trip over this route one of the most delightful summer tours in the world."

New Bedford & Taunton.

The New Bedford (Mass.) *Standard* says : "The Boston, Clinton & Fitchburg Railroad Company has made an offer to lease the New Bedford & Taunton Railroad for 50 years, and a proposition is daily expected from the Boston & Providence road for a union and consolidation of the two. Nothing is done yet about the Taunton Branch, but it is not expected that the parties who succeed in getting control of the New Bedford & Taunton road will have any difficulty in making terms with the Taunton Branch. The Old Colony corporation is not moving in the matter."

Vermont & Canada.

The annual meeting of the stockholders of this company was to be held at St. Albans, Vt., October 17, when directors were to be elected and other necessary business transacted.

Athol & Enfield.

Judge Hoar having given an opinion that the company had a legal right to increase the amount of the capital stock, the directors voted, October 15, to add $300,000 to the capital, making the whole amount $800,000. It is probable that the balance of the city of Springfield's subscription will not be much longer withheld.

New Mail Route.

An extension of mail service has been ordered by the Post Office Department from Reedsburg to Elroy, Wis., 22 miles, on the Madison Extension of the Chicago & Northwestern Railway, at the rate of $2,180 per annum.

Wisconsin Valley.

This company is constructing a line from Tomah on the West Wisconsin road northeast to Grand Rapids on the Wisconsin River, with the intention of extending its line southwest from Tomah to the Mississippi, and north from Grand Rapids up the Wisconsin River to Warsaw. The line from Tomah to Grand Rapids, 45 miles, on which the grading is nearly finished, runs from Tomah to Yellow River, 28 miles, through an agricultural country, but at Yellow River it reaches the lumber regions, and from that point to Grand Rapids passes through extensive forests of pine and hard wood. Five miles below Grand Rapids the road reaches the Wisconsin River, which at that point can furnish very extensive water power. The company now proposes to bond the road for $16,000 per mile in order to obtain means to complete the graded portion of the line, and build the proposed extensions. The principal traffic of the road is expected to be in lumber, and the lumbermen along the line have so far furnished the means for its construction.

Chesapeake & Ohio.

On the 12th, it is reported, the gap between the completed sections was reduced to 50 miles, while iron was going down at the rate of a mile a day. It is confidently expected that trains will run through from Richmond to the Ohio River some time in December.

Welland Canal.

Contractors are informed that certain parts of the works connected with the enlargement of the canal, and also for parts of a new line east of the present line from Marlatt's Pond to a point near Port Dalhousie, will be open for proposals next December, and that surveys have already made such progress in some places as to enable the contractors to examine the ground before winter sets in.

Richmond & York River.

A committee has been appointed by the stockholders of the company, with full authority to sell road, franchises, rolling stock, etc., publicly or privately. The debts of the company are very considerable, but all the creditors and bondholders, it is said, acquiesce in the proposed sale.

California & China.

The "White Star Line," one of the most successful and best liked of the newer steamer lines between New York and Liverpool, is about to put on a line of five steamers—the Republic, Atlantic, Asiatic, Tropic and Rimac—to ply between San Francisco and China, thus competing with subsidized Pacific Mail Company. The Republic has already sailed from Liverpool to Valparaiso, on its way to take its place in this line. It and the Atlantic have for some time sailed between New York and Liverpool.

Brookville & Mahoning.

The Harrisburg (Pa.) *State Journal* says that the railroad from Brookville to Mahoning is rapidly progressing, and three miles of track has been laid on the lower end of the road. The line is from Brookville, in Jefferson County, Pa., on the Eastern Extension of the Alleghany Valley Railroad, south to Mahoning, in Indiana County, a distance of about 20 miles.

Denver, South Park & Pacific.

This is the name of a newly organized company, which proposes to build a narrow-gauge railroad from Denver, Col., southwest through the mountains into the South Park. The capital stock is to be $2,500,000, and the corporators are : Bela M. Hughes, Joseph E. Bates, Charles B. Kountze, David H. Moffat, Jr., Frederick A. Clark, F. Z. Salomon, Henry Crow, W. S. Cheeseman and John Evans.

Railroad Subsidies in Ohio.

The Cincinnati correspondent of the New York *Bulletin* writes :

"Ohio has lost forty millions by railroads, because she allowed her politicians to build them, who had neither the technical knowledge nor the industrial economy to do this work. They were nothing but plausible talkers. They had diddled the voters on politics and now diddled them on railroads. Seven millions were fooled away by such men in the Zanesville Railroad, ten in the Marietta, six in the Ohio Central, three in Cincinnati, Hamilton & Dayton, and the rest in the Fort Wayne Railroad, the Cleveland & Pittsburgh, the Tiffin & Fort Wayne, the Mad River & Bellefontaine, the Springfield, Mount Vernon & Pittsburgh. All because babbling, plausible men administered the money. And why were these men intrusted with this matter? Because men were wanted who could tell lies!

"Now, it must be plain that the new mania for public subscriptions and public debts require again the confiding of our railroad construction to the same class of men, only we descend to a lower order. This time county commissioners and township trustees are to have the work done and the same swindle is to be practiced, when the road is to be transferred to the respective railroad by a lease—a large amount of foul voting is inevitable, for the questions put to the untaxed voter is : 'Will you not vote yourself a railroad?' or, to the interested taxpayer : 'Will you not vote yourself ten dollars for the one you will have to pay?'

"And what is the result? First and foremost, the road will cost two dollars where it should one, and the interest on this excessive cost will enter hereafter every freight and passenger rate; next the road will be badly located, for the object is to purloin public money and all kinds of false promises as to location have to be made. And with all this before our eyes, we are amazed, that there is public demoralization? The man who bit his mother's nose off when about to be hung, did exactly the justice which future voters will pronounce on the generation that voted itself railroads, and transmitted the evils of their votes to posterity."

Cincinnati and the Chesapeake & Ohio.

An earnest effort is being made in Cincinnati, and along the north side of the Ohio from that place to Huntington, to secure the construction of a railroad up the river to connect with the Chesapeake & Ohio at Huntington. By surveys made two years ago the line is 149.7 miles long, the maximum grades 15 feet per mile, and the estimated cost of roadbed ready for ties and rails, $1,985,546—about $13,237 per mile.

Philadelphia & Reading.

It is reported that holders of nine-tenths of the stock have subscribed for $9,350,000 of the loan of $10,500,000, which they were permitted to take at par to the extent of 30 per cent. of their holdings of stock, and that they have subscribed in excess of the 30 per cent. to the amount of $4,250,000.

It is also reported that the company has purchased the old track of the Philadelphia, Wilmington & Baltimore road from Gray's Ferry (which is two miles below Philadelphia) southwestward 12 miles to Ridley Creek, and is purchasing at Lamokin, near Chester, a tract of land for coal yards.

Chesapeake & Delaware Ship Canal.

Officers and engineers of this company have been reconnoitering the Delaware peninsula in search of an advantageous location for this proposed canal, by which it is hoped that a direct channel for ocean steamers from Baltimore to the sea may be opened, rendering unnecessary the long detour to the mouth of the Chesapeake, in which steamers from Baltimore bound north of east first sail 250 miles nearly due south. Such a canal might bring Baltimore 16 hours nearer the European and upper Atlantic ports. The estimated cost of such a canal is three or four millions.

Northern Pacific—Pacific Division.

The track was laid to the last crossing of the Olequa, September 21. At that point an unfinished bridge delayed the trackLayers for a few days. The bridge was finished September 24 and it was expected that by October 5, cars would be running to a point 26 miles beyond Pumphrey's, the late terminus, and 54 miles from Kalama.

Utica & Black River.

Track-laying has been commenced on the extension from Carthage, N. Y., to Clayton. Three miles of track was down on October 12, and most of it was ballasted, the ballasting train following the track-layers as closely as possible.

Milwaukee & Northern.

The track is laid seven miles beyond Chilton, and within about 17 miles of Menasha. It is expected that track will be laid to Menasha by November 15. The contract for the erection of the Union depot at Menasha has been let to Schnellen & Schneider.

Memphis & Little Rock.

The inclined plane on the Memphis side of the river having been completed, the first train of cars from Little Rock was transferred across the Mississippi by ferry boat, October 7. Hereafter all trains will start from, and run to, the new depot in Washington street, Memphis.

Davenport & St. Paul.

The contract for the bridging of the road from Fayette, Iowa, to the Minnesota line, a distance of about 45 miles, has been let to S. W. Cochrane, of Davenport, Iowa. The amount of bridging required will be in all about 500 feet. The contract for pile-driving on the same section of road has been let to R. Ballantyne, of Davenport. The iron is now laid two and one-half miles north of Delaware Center, the crossing of the Iowa Division of the Illinois Central. The present end of the track is 14 miles from Hopkinton, the late terminus, and about 94 miles from Davenport.

Chippewa & Red Cedar.

A company by this name has been organized to build a road from the Mississippi River, opposite Wabashaw, Minn., by way of Durand and Menomonee to Lake Superior, with a branch to Eau Claire and Chippewa Falls. A board of directors has been chosen, and a preliminary survey is to be made at once. The company talks of getting the land grant made some years ago for a railroad up the Chippewa valley.

Chicago & Superior.

A section of about 20 miles of this road is graded and ready for the iron from Portage, Wis., north toward Friendship.

Hoosac Tunnel.

The progress of the Hoosac tunnel during September was as follows : East end, 112 feet; west end, 85 feet; central shaft, 105; total, 312 feet. Total length opened to October 1, east end, 10,935 feet; central shaft, east, 1,233 feet; west, 339 feet; west end, 8,298 feet; making a total of 20,809 feet; leaving 669 feet between the east end and central shaft, and 3,557 feet between the west end and central shaft.

Boston & Maine.

The Portland, Saco & Portsmouth Railroad Company having asked for an injunction to prevent the Boston & Maine Company from building their road over their present location at North Berwick, Me., the Court granted a provisional injunction applying to passenger trains, but exempting construction trains, with the limitation that they shall not be run when trains on the Portland, Saco & Portsmouth road are due. The ground of the complaint was that the Boston & Maine tracks, as now located, are so close to the track of the other road as to obstruct its business.

Lee & New Haven.

The directors have ordered an assessment of 10 per cent. on the capital stock.

New Orleans, Mobile & Texas.

Mr. S. H. Kennedy, in a letter to the New Orleans *Picayune*, under date of October 5, says :

"Messrs. Bushnell & Co., large contractors, have already signed a contract to complete the road to Houston for the $7,419,000 bonded securities, which securities are placed in the hands of J. & W. Seligman & Co., provided those securities will be taken from them at fifty cents on the dollar, they themselves heading the subscription for $500,000, leaving less than $700,000 to be subscribed for by other parties.

"The terms of the contract are that these securities shall be taken from the Messrs. Seligman & Co., and paid for at fifty cents on the dollar as the road progresses to the completion of every ten miles. Therefore money is paid out by the syndicate as the work is done. The State National Bank, the syndicate here, will be governed by the same rule. The contract is for the road from Donaldsonville to Houston, Texas. The securities are those connected with the completion of that part of the road.

"The distance is 270 miles, and under the contract they can obtain those securities, except the subsidy bonds, upon the

completion of every ten miles, or $274,000 of all the securities, which, at 50 per cent., gives $137,000 each ten miles. Suppose they are eight months completing the road; this would give monthly installments of $465,000, or about 12½ per cent. per month for subscribers to pay on their subscriptions.

"Amount of securities $7,419,000 at 50 per cent., $3,709,500; 12½ per cent. is $463,687.50 per month.

"Say for eight months is $3,709,500. This makes the terms of payment easy, and for every 12½ per cent. you will know the road is one-eighth nearer completion."

It still appears to be somewhat doubtful whether the amount of money needed can be raised. In connection with this effort to build the road, the fact is mentioned that Mr. Morgan is still busy dredging out the channel at Berwick Bar, and otherwise improving his railroad and wharves, and is evidently not disposed to give up any part of the traffic now carried by his steamship line from Berwick Bay to Galveston without a sharp struggle.

Montpelier & Wells River.

The Montpelier (Vt.) *Freeman* says that "the iron will not be laid on the Montpelier & Wells River Railroad route this fall as contracted for. The advance in iron during the summer has been twenty dollars a ton, and this advance would increase the cost of the road to the contractors about $70,000, so they prefer to pay damages for non-fulfillment. The directors of the road are not agreed, however, as to what course now to pursue, some desiring to see a portion of the road, at least, completed this fall, and others thinking that nothing valuable can now be gained, looking to the best interests of the road, by that course."

Elkton & Massey's.

A railroad is proposed, to run from Massey's, Md., the junction of the Kent County and Queen Anne's & Kent Railroads, north to Elkton, on the Philadelphia, Wilmington & Baltimore road. The road would be about 25 miles long.

Chicago, Dubuque & Minnesota.

Trains now run regularly from Dubuque to Brownsville, Minn., from which point passengers and freight are carried to La Crosse, Wis., a distance of 10 miles, by the river, a steamboat making regular connections with all trains.

St. Paul & Iowa Southern.

Iowa papers report that this road is under contract to some German capitalists and that it will be constructed from Mason City, at the crossing of the Iowa Central and the Milwaukee & St. Paul roads, southwest to Boone, on the Chicago & Northwestern road, within a year. The distance is about 95 miles. The sum of $150,000 is asked for along the line.

Northern Pacific.

Captain S. C. Kellogg, of the Fifth Cavalry, who accompanied the escort of the Northern Pacific engineering party from Fort Rice on the Missouri westward about 250 miles to the Yellowstone at the mouth of Powder River, where the engineers began the location of a line for the railroad eastward, has returned and rendered a report to the War Department. The expedition was attacked by small parties of Indians, but met no serious obstacles. A favorable route for the railroad was found, avoiding for the most part the "Bad Lands," and where there is wood, grass and water sufficient for easy campaigning. The streams were mostly small, with light fringes of timber, and on the Little Missouri, whose valley, however, is narrow, some pine. The country was entirely without game, though there were signs that buffalo had been abundant within two years. The Yellowstone above and below the point where it was struck as far as could be seen had a level valley about two miles wide, hedged in with high bluffs, the river being about 75 yards wide, deep and swift. Extensive beds of lignite and semi-bituminous coal were found at intervals over almost the entire line.

The route of the railroad west of this point (the junction of the Powder River with the Yellowstone) will doubtless be in the Yellowstone valley nearly to its head, which will bring the road nearly to the mountains, and no engineering difficulties are likely to be found on that section of the line. There, too, it is expected that a more attractive country than the section just explored will be found.

A telegram from San Francisco, dated the 11th, says:

"The Northern Pacific Railroad party has returned to Portland, Oregon, in good health, after ten days' absence. They explored all the harbors and channels, run their lines 400 miles around Puget Sound, examined the valley of the Columbia River 300 miles to the mouth of Snake River, and express the strongest admiration of the entire route personally surveyed by them. Responsible parties have made favorable proposals for the immediate construction of a railroad on the coast, and also one from the Columbia River eastward."

The St. Paul (Minn.) *Press*, of October 10, says:

"Dr. George Keith, a member of the firm of Burleigh & Keith, who have the contrac for grading the fifty miles of the Northern Pacific next east of the Missouri, has lately returned from that part of the country, and brings some interesting intelligence.

"The track, he says, is down 130 miles west of Fargo, leaving but 78 miles to carry the road to the Missouri. If no delays occur, the whole distance will be graded in less than a month.

"Messrs. Burleigh & Keith have 200 men and 300 teams now at work on their contract. Bridge-building has somewhat delayed work in the past, but the iron is now going down at the rate of three miles per day, and the road is to be completed to the Missouri by December 1.

"No difficulties have been experienced from the Indians, although small bands of roving Sioux frequently visit the camps."

St. Paul & Pacific.

Many rumors having been spread concerning the suspension of work for the season on the Brainerd Branch and St. Vincent Extension of this railroad, the St. Paul *Press* says:

"The simple fact, as we are informed, is that the suspension of work is occasioned wholly by a temporary misunderstanding between the European financial agents of the company as to the terms of the agreement on which the bonds were negotiated. In consequence of this misunderstanding, the transmission of the money realized on the sale of the bonds, and required for the completion of the work, has been postponed until a satisfactory adjustment shall have been arrived at. As the beginning of the month found the difficulty unadjusted, and the required funds still locked up in the squabble between the European parties, while only some four weeks of the season remained, Mr. Becker found it necessary to order a suspension of the work till this knot shall be untied.

"The street gossips, with that marvelous facility for confounding things that have no connection, for which street gossips are famous, have been quite busy for two or three days in circulating the story that the Northern Pacific Company had suspended work for want of funds. This effort of invention or blunder of misinformation is wholly groundless. The Northern Pacific Company have never dreamed of suspending work on their road. The Northern Pacific and St. Paul & Pacific Companies are totally distinct but affiliated corporations, drawing their funds from totally different sources, each on a totally different basis. The present difficulty in nowise concerns the Northern Pacific, except as it may delay their connections with the St. Paul & Pacific. And as the work of construction would have terminated at any rate for this season early in November, all the St. Paul & Pacific loses by the proceeding is about a month's time. If anybody supposes that the great association of wealthy capitalists who have already twenty millions of dollars invested in the St. Paul & Pacific are going to stop the work now when a few hundred thousand dollars is all that is necessary to complete it, and to secure the grant on which these bonds are based, he must be a very foolish individual to say the least."

It has been very widely announced and believed that the St. Paul & Pacific Railroad is leased or owned by the Northern Pacific Company. The sworn statement of Northern Pacific officers contradicts this. There is—or was last spring—no connection whatever between the two *companies*, but it is true that some of those interested in the Northern Pacific have a controlling interest in the St. Paul & Pacific also. The companies remain entirely independent, are in no way responsible for each other's debts or affected by each other's good or bad fortune, except as it may be caused by the fortunes of the individuals who are members of both companies.

New York & Harlem.

The board of engineers for the "Fourth Avenue Improvement" announce that misapprehension exists among contractors in regard to the manner of doing a portion of the work between Seventy-ninth street and Harlem River, that the proposals already received for this work are returned to the bidders, and that the whole work between the points named is reopened for proposals from all contractors. Sealed proposals will be received until noon on the 22d, and the board has plans, specifications and blank proposals ready.

South & North Alabama.

The opening of this road has been celebrated by an excursion to Louisville, in which many merchants and prominent men from South Georgia, Florida and Alabama took part. The excursionists visited the Exposition at Louisville October 10, and were entertained by the citizens of that place.

California & Nevada Narrow-Gauge.

It is proposed to build a narrow-gauge road from Stockton up the Mokelumne River and North Fork to Silver Mountain, thence through the old Henness Pass to the head of the Carson River and down into Carson Valley. A great part of the road would be along the banks of the canal just commenced, which is intended to carry the water of the Blue Lakes to San Francisco.

Indianapolis, Block Coal & Western.

This company filed its articles of incorporation with the Secretary of State at Indianapolis, October 10. The road proposed will extend from Indianapolis southwest through the counties of Marion, Hendricks, Morgan, Owen, Clay and Sullivan. Thomas A. Morris, J. C. Shoomaker, S. A. Fletcher, Jr., John M. Lord, E. J. Peck, W. O. Rockwood and A. H. Pettit are elected directors for the first year.

Saginaw & St. Louis.

The Jackson (Mich.) *Citizen* says that work on this road is progressing finely, and the track-layers are now near Swan Creek and about seven miles from Chesaning. This latter town is on the Jackson, Lansing & Saginaw road, 20 miles south of Saginaw.

Kansas City & Lawrence.

This proposed road is to run from Kansas City, on the south bank of the Kansas River, west about 24 miles to De Soto, where it will connect with the Lawrence & Pleasant Hill road, thus forming a new line from Kansas City to Lawrence.

Chicago & Northern Pacific Air Line.

The Geneva (Wis.) *Herald* says:

"We cannot help rejoicing at the flattering prospects which now present themselves to this section of country. Work has commenced between Chicago and Richmond Junction, another force is between Geneva and Elkhorn, and sub-contracts are being given from Elkhorn to Whitewater, and other sections through to Jefferson, 300 men and 200 teams are advertised for in the Chicago dailies, men to receive $2 per day, and with teams $4. We are also informed that 300 men and teams are to be called for at once between Geneva and Elkhorn."

Green Bay & Lake Pepin.

There is some talk of changing the route of this road from the Trempeleau Valley to the Black River Valley. It is said that the company have offered to run the road from Merillon to Black River Falls and thence to La Crosse, provided the town of Black River Falls will grade and tie the road from that point to Merillon, a distance of five miles.

Sheboygan & Fond du Lac.

Work will be commenced on the extension from Princeton, Wis., to Montello, about October 15.

Missouri, Kansas & Texas.

Texas papers report that there is a difference of opinion between this company and the Houston & Texas Central as to the location of the junction of the two roads. The Missouri, Kansas & Texas Company wishes to adhere to the locality already chosen and called Red River City, while the other company desires to make the junction at a point nearer the river. The Sherman (Tex.) *Patriot* says: "We learn that a large number of hands, probably 200 or more, were put at work on this side of the river last week by the contractor on the Missouri, Kansas & Texas road. Large numbers of hands and wagon loads of tools have been sent up to the Central road, and they are offering from $2 to $2.25 gold per day for laborers. Last week the ferry at Colbert's was busy for some days in transferring hands and teams to this side, which were taken from the grading on the north side of the river. We also learn that an injunction, applied for by the Central to stop the other company from infringing on its chartered rights, has been granted and service made upon some of the parties, but they have dodged out of the way and taken refuge across the river in the Chickasaw Nation. On Thursday last other injunctions were sent out to be served. The attorney of the Central, Col. Goldthwaite, of Houston, arrived Wednesday night, and we suppose 'business' will begin in earnest soon, if a satisfactory settlement is not arrived at by the parties."

Frederick & Pennsylvania Line.

The following are the names of the stations on this railroad, which has just been completed: Frederick, Harmony Grove, Johnson's Station, Georgetown, Woodsboro', New Midway, Ladiesburg, Loat's Junction, Taneytown, Shue's Station, Kingsdale and Littlestown. The distance from Frederick to Littlestown is 36 miles. At Loat's Junction, 17 miles from Frederick, the road intersects the Western Maryland Railroad.

Bedford & Bridgeport.

The last rail on this road was laid at the Maryland State line, October 8, and the locomotive passed through to the junction with the Cumberland & Pennsylvania road at Corrigan's, three miles from Cumberland, Md. Regular trains will be put on as soon as the time-table can be arranged. This road, in connection with the Huntingdon & Broad Top road, completes a line 83 miles long from the Cumberland coal mines to the Pennsylvania Railroad at Huntingdon.

Central of New Jersey.

The work on the permanent roadway for the Newark & New York road through Bergen Hill is making fair progress. The permanent road, which passes through a cutting in some places over 50 feet deep, is for nearly the whole distance through a solid, close-grained trap rock, the surface earth being nowhere more than 12 or 15 feet in depth. All the hoisting and the heavy drilling are done by steam. The steam-drills work at the rate of three feet an hour, the holes being two and a half inches in diameter and some of them twenty feet in depth. Giant powder is used in blasting. There are two excavations, one on the Newark side of the hill, and one just east of Bergen Avenue station. The rock at the first is carted out on a temporary tramway and used to build up the road-bed between the hill and the Hackensack River. At the second excavation the stone is hoisted out by a steam derrick and piled upon the bank for future use. The contractor, Mr. G. M. Rusbury, has been at work a little over a year, and in that time has cut over eight hundred running feet of solid rock, and built over fifteen hundred feet of running road-bed. The work advances at the rate of forty to fifty running feet a month. It will take about a year to finish it. The total cost will be in the neighborhood of two hundred thousand dollars. Construction trains are also at work filling in the trestle-work between the Passaic and Hackensack rivers. The temporary road at present used runs over the hill, necessitating the use of very heavy grades.

Houston & Texas Central.

It is said that this company will shortly commence the construction of the Northeast Branch. This branch will begin at a point on the main line in Navarro County, and run through Kaufman, Hunt, Hopkins and Delta counties to Paris in Lamar County, a distance of about 120 miles.

Danville & Chatham.

A railroad is proposed from Danville, Va., nearly due south through Caswell and Alamance Counties, N. C., to the coal fields of Chatham County. Such a road would be about 75 miles long, and would, for nearly all its length, be a considerable distance from any other railroad.

Fayetteville & Florence.

This company, which proposes to build a road from Fayetteville, N. C., southwest to Florence, S. C., a distance of about 80 miles, is giving some signs of life. The town of Fayetteville has voted to subscribe $75,000 to the road.

Ridgefield Park.

The grading on this railroad is nearly completed, and it is expected that the rails will be laid and the road ready for travel early in the spring. The road runs from the New Jersey Midland Railroad a short distance north of New Durham, N. J., and runs north to the New York State line, a distance of about 12 miles. It runs parallel to, and about equi-distant from, the Northern New Jersey road and the Hackensack Branch of the Erie. It will be operated as a branch of the Midland road and will be chiefly valuable for suburban traffic. It is intended to extend it to Haverstraw, N. Y., as soon as possible.

Texas & New Orleans.

The Galveston (Texas) *News*, of October 9, says:

"That part of the Texas & New Orleans Railroad (or the Gentry road, as it is sometimes called) between Houston and Liberty, a distance of forty miles, with the franchise and what little there is of the rolling stock, was sold at public sale yesterday at the court house for the sum of $240,000. It is understood that it was purchased for the New Orleans, Mobile & Texas Railroad Company. The lands belonging to this road, amounting, we understand, to 623 sections, were sold separately, for twenty-five cents per acre, the same company being understood to be the purchasers. We have already noticed that the people of New Orleans are now making an effort to complete the Mobile road to Houston, by way of Donaldsonville. It is understood that the company have made the above purchase with a view to make it a part of the road from Mobile to Houston. It is understood that the balance of the old Gentry road east from Liberty already belongs to the same company."

Mansfield, Coldwater & Lake Michigan.

The Mansfield (Ohio) *Herald* says: "The track-laying on the Mansfield, Coldwater & Lake Michigan Railroad is progressing rapidly, and the track-layers are now some distance west of the crossing of the Cleveland, Columbus, Cincinnati & Indianapolis road."

Perth Amboy & Elizabethport.

Considerable progress has been made on this road, the northern section of the New Jersey Central Company's Long Branch line. The track has been laid from the junction with the Central Company's Newark branch to the bridge over the Elizabeth River, about three-quarters of a mile. The superstructure of this bridge is being put up, and the grading across the meadows beyond the Elizabeth River is nearly completed. The road runs across the Salt Meadows for about three miles, reaching the high lands near Morse's Mill, and will consequently pass too far east of Rahway to give the people of that town the competing line which they have long hoped for. A branch road about two miles long is proposed, to run from Rahway to the new road at or near Morse's Mill.

Union Pacific.

The sales of the land department for the month of September were 14,086 acres for $71,207, being an average of $5.05 per acre. The number of purchasers was 155, giving an average of 91 acres to each purchaser. The total sales from July 28, 1869, to September 30, 1872, were 628,394 acres for $2,664,431, being an average of $4.24 per acre.

Toledo & Southwestern.

A new line is to be surveyed from Toledo to Grand Rapids, Ohio. The new line will be more direct than that previously surveyed. Bloom and Portage townships having failed to vote aid, it is probable that the road will be built by way of Fostoria.

Delaware River & Lancaster.

It is reported that the officers of this company have secured sufficient means to construct the road from Lancaster east to Springfield on the Wilmington & Reading Railroad, a distance of about 28 miles. The road is intended to run eventually to the Delaware River.

Meredith & Conway.

Surveyors are locating a railroad from Meredith Village, N. H., on the Boston, Concord & Montreal road, northeast through Centre Harbor, Moultonborough and Tamworth, to Conway on the Portland & Ogdensburg Railroad. The road will be about 50 miles long.

Texas & Pacific.

Contracts were to be let in Marshall, Texas, on the 1st for 500 miles of the line, on which work is to be begun immediately.

Houston & Texas Central.

A correspondent at Dallas, Texas, informs us that on the 1st the track was laid for 15 miles north of Dallas.

Poughkeepsie & Eastern.

This road is now completed, and regular trains are running from Poughkeepsie to the Connecticut State line, a distance of 43 miles. The only work remaining to be done is the short section in the city of Poughkeepsie, extending from the present depot in Smith street to the Hudson River. The grading on this is completed, and tracklaying has been commenced. The stations and distances on the recently-completed portion of the road, from Pine Plains, on the Dutchess & Columbia road, the late terminus, are: Hiserodt, 2 miles; Ancram Lead Mines, 4; Halstead's, 6; Tanner's, 8; Boston Corners, 11; Mount Riga, 14; State Line, 18. At Boston Corners the road crosses the Harlem road and runs alongside of that road to Mount Riga,

and at State Line connection is made with the Connecticut Western road. The new portion of the road runs through extensive beds of iron ore, which are largely worked at Tanner's, Mount Riga and Ancram Lead Mines, and a considerable traffic in iron ore is expected, both west to the Hudson River and east to the extensive furnaces of Salisbury, a short distance beyond the State line.

Danville & Paxton.

The contract for the construction of this road from Danville, Ill., northwest about 40 miles to Paxton, has been let, and the grading and bridging is to be completed in three months. This will give the Illinois Central a short route to Danville and a good route to the Brazil coal fields.

Intercolonial.

At the close of last month only 12 miles remained to construct to complete the connection with the line to Halifax.

Windsor & Annapolis.

It has been reported that this Nova Scotia railroad had been sold. Mr. Vernon Smith, the late manager, contradicts this report, but that no method has been found to relieve the company of its embarrassments. The bonds have only one more year to run; the directors have no authority to replace them with new securities; authority can be had only by obtaining additional legislation; additional legislation can be obtained only by the request of a general meeting of the shareholders, and it is said that the directors dare not call such a meeting for fear the debts incurred by them for the benefit of the road will be repudiated.

Valley, of Virginia.

The annual meeting of this company was held at Winchester, Va., September 25. The annual report of the Treasurer showed that there had been paid in cash by Baltimore & Ohio Railroad $300,000, Staunton $54,000 and individual subscriptions $32,777, and that $93,552.17 had been expended, leaving a balance of $293,224.83 in the hands of the Treasurer. The engineer's report estimated the cost of the road, with iron bridges, at $5,700,000, giving the estimates in detail. The location of the road through the county of Rockbridge on what is called the central line, was approved, and the following resolutions passed:

Resolved, That the board of directors be and they are hereby authorized and empowered to issue the bonds of this company, to be secured, in legal form, by a trust deed upon the franchise, effects, assets and the property of the company, for the purpose of dividing the means, in addition to the subscriptions of stock adequate for the completion of the Valley Railroad from Harrisonburg, in the county of Rockingham, to some point on the Virginia & Tennessee Railroad, at or near Salem, as required by the ordinance of the city of Baltimore.

Resolved, That so soon as the Finance Commissioners of the city of Baltimore have paid up 30 per cent. upon the stock in this company, subscribed by them, the board of directors are directed to let contracts in each of the counties through which the Valley Railroad has been located, and to procure the bonds of the respective counties along the line (according to the terms of their subscriptions), in order that they may proceed, as promptly as practicable, to complete the construction of the road throughout its entire line.

It was also resolved that the number of directors be reduced to ten, besides the President.

Canada Pacific.

The *Canadian Monetary Times* says: "A St. John journal mentions the departure from that city of Hon. Mr. Tilley and Hon. Dr. Tupper for Ottawa, on whose arrival, it is stated, the Pacific Railway contract will be disposed of. This statement, though perhaps not official, harmonizes with the declarations of Sir George Cartier and Sir Hugh Allan on the eve of the election in Montreal. In contradiction of the statement that the two rival companies had amalgamated, we hear that a serious hitch has occurred; that they cannot come to terms, and that the contract is not likely to be let till some new basis of arrangement can be arrived at. Meantime we have news from the surveyors operating to the west of the Rocky Mountains, which appears elsewhere. Mr. Marcus Smith, the engineer in charge of the survey on the Pacific Coast Division, makes the statement that 'after careful surveys he found the country not so difficult as was expected, and is hopeful that a good line of railway can be obtained even through the Cascade range at less cost than was at first anticipated.' Doubtless the government are by this time in possession of sufficient information to enable one to form a pretty good opinion of the general character of the route, and of the main difficulties to be encountered in building the road."

Montrose.

A correspondent writes of this narrow-gauge railroad, that the recent abandonment of the North Branch Canal made unnecessary one of the bridges it was expected to build. There is difficulty in securing a sufficient force, still it is hoped that the road will be completed this fall. There is now 10 miles of track laid, and five more will be ready probably before the 20th. Engine No. 1, from the Baldwin Locomotive Works, is on the track, readily drawing 20 tons of iron up the steepest grade (96 feet), with a loaded construction car behind, making a total weight of about 40 tons, at about 18 miles an hour.

Cincinnati Tunnel.

A contract for the construction of this tunnel, with a double-track railroad from Cincinnati to Sharon, was let about a year ago to Gen. J. C. Fremont and Mr. S. W. Morton, who were to receive in payment the preferred stock and mortgage bonds of the tunnel company. The only progress made by them has been to clear out one or two of the shafts and some machinery in position. They have now assigned their contract to Mr. Henry Seligman, of New York, and it is thought that now the work will be completed without unnecessary delay.

Chicago, Pekin & Southwestern.

The track of this road is now completed from Streator, Ill., southwestward nearly to Eureka, Ill., on the Toledo, Peoria & Warsaw Railway 19 miles east of Peoria. Thence it is proposed to run trains over the last named road to Washington, seven miles, from which point southwestward to Pekin the road has been completed for some time. It is expected that trains will be running by November.

Catawissa.

The Philadelphia *Public Ledger* says: "The following is understood to be the substance of the terms of the lease, which is for 999 years, of the road and properties of the Catawissa to the Reading, namely: The Catawissa Railroad is to receive each year 30 per cent. of the gross receipts, the Reading to guarantee the first year the interest on all loans and $154,000; the second year the interest and $178,000; the third year the interest and $202,000; the fourth year, and ever after, the interest and $226,000. The Catawissa Railroad is to issue $1,000,000 new stock, to bear interest in 1874 of 2½ per cent.; in 1875, of 4½ per cent.; and in 1876, and ever after, 7 per cent. The preferred stockholders are to be authorized to subscribe at the rate of 45 shares for every 100 shares in stock, and to pay for the same by relinquishing all claims for arrears of dividends. In case the receipts for any one year fall short of the amount named above for said year, the Reading Railroad Company to have no claim on the receipts of any other year. From this data the reader will learn the cause of the large advance in the price of the preferred shares. The lease is considered mutually advantageous by the respective parties to it, and, as the assent of the stockholders on neither side is required to ratify the agreement, it may be considered accomplished."

This railroad extends from Williamsport, Pa., on the Philadelphia & Erie railroad, 40 miles above Sunbury, southward down the Susquehanna, and only separated by it from the Philadelphia & Erie, to Milton, 27 miles, and thence east to Tamanend, 67 miles. Near this eastern terminus it connects with a branch of the Reading, 104 miles from Philadelphia.

Coal Depot at Providence, R. I.

The Boston *Advertiser* of October 8 says:

"A Pennsylvania coal company has recently purchased sixty-five acres of land at India Point, Providence, for a coal depot, and will begin work, preparing the docks, tracks, etc., immediately. It is understood that the Providence & Worcester Railroad Company will build a branch road from Valley Falls to India Point to accommodate its coal business."

Vermont Central.

The St. Albans *Messenger* says that the work of cutting down expenses on the Vermont Central has begun in earnest. Nearly one-third of the train men are being discharged, while the remainder who have to assume their duties have their pay increased only one-fifth. Upward of forty shop hands have been discharged, and the pay of the remainder cut down from ten to fifty cents each a day. There is much less activity in the shops than heretofore. Some of the section men have also been discharged, and if any officers or clerks can be spared they will probably also be discharged.

Delaware & Pennsylvania.

This road, which is to connect with the Pennsylvania & Delaware road at the State line, is completed eight and one-half miles north from Delaware City. The grading is nearly completed and the whole road will probably be finished by November.

Wilmington & Western.

This road, from Wilmington, Del., west to Landensburg, Pa., will be formally opened October 19.

Maryland & Pennsylvania.

This company, which proposes to build a double-track, narrow-gauge railroad from Baltimore to the Pennsylvania State line, there to meet the Juniata & State Line Railroad of Pennsylvania, has been making surveys for its road through Baltimore County. It is reported that money enough to build the road has been secured.

Gloversville & Northville.

Ground was broken on this road September 26, and work will proceed as rapidly as practicable. The road is to run from Gloversville, N. Y., the terminus of the Florida, Johnston & Gloversville Railroad, to Northville.

Chicago, Danville & Vincennes.

A meeting of the stockholders of this company is to be held at the office of the company, 252 West Randolph street, Chicago, at 10 a. m., October 17, to consider and vote upon a contract between the company and the Evansville, Terre Haute & Chicago Railway Company.

St. Louis & Springfield.

The road has been finally located from Springfield, Ill., to Litchfield, and contracts for that section, about 45 miles, are to be let at once. President S. H. Melvin and Secretary John A. Chestnut are authorized by the board of directors to complete the contract.

Chester & Iron Mountain.

This company has let the contract for grading their road to Hanford, Decker & Co., the work to be completed by September 1, 1873. The road is to run from a point in Perry County, Mo., opposite Chester, Ill., west to the Iron Mountain, a distance of about 60 miles.

National.

Chancellor Zabriskie, of New Jersey, has issued a decree ordering this company to show cause why it should not be restrained from constructing its proposed railroad across New Jersey. The trial will doubtless decide finally as to the validity of the Stanhope charter. It is reported that if obstacles can be opposed to hinder the construction until the meeting of the Legislature, an effort will then be made to repeal the charter.

Great Western of Canada.

A correspondent writes: "The increase of traffic over this road has compelled the management to add largely to the rolling stock in both passenger and freight departments, and to put on a second car ferry between Detroit and Windsor. The new coaches just placed on the road, in elegance and comfort, are unsurpassed on this continent, being inferior to Pullman cars only in the disposition of seats and economy of space. The seats themselves are far more comfortable than any of Pullman's."

Projected Mississippi Railroads.

A correspondent in Mississippi has prepared the following statement of the railroads projected or in progress in that State, which is carefully made, and probably very nearly exact:

Projected Roads.	*No. Miles in Miss.*
North Mississippi (from Pontotoc to Grand Junction)	57
Ship Island, Ripley & Kentucky (from Mississippi City to Tennessee State line)*	278
Corinth & Nashville, from Corinth to Tennessee State line	5
Sardis & Mississippi River, from Sardis to Friars Point	40
Elyton, Corinth & Tennessee River, to Hamburg	35
Helena, Water Valley & Easton, from Helena to Okolona	113
Vicksburg & Memphis	180
Arkansas City & Grenada	85
Vicksburg & Nashville	222½
Greenville, Deer Creek & Rolling Fork	50
Lexington Branch, from Durant on Miss. Central to Lexington	12½
Winona & Yazoo, from Winona to Greenwood	28
Elyton & Aberdeen	30
Grenada, Louisville & Meridian	130
Artesia, Starkville & Grenada	73½
New Orleans, Jackson & Great Northern, extension above Canton to State line	145
Natchez, Jackson & Columbus	217½
Mobile & Northwestern	660
Vicksburg, Canton & Yazoo City	53
Gulf & Ship Island, from Canton to Mississippi City	163
Vicksburg & Pensacola and Ship Island Branch	280
New Orleans & North Eastern, from Mississippi and Louisiana State line to Meridian	123½
Meridian, Red River & Texas and New Orleans Branch	238
New Orleans & Natchez, from Natchez to Oayka	67½
New Orleans & Selma	105
Yazoo City, Raymond & Crystal Springs	62
Columbus, Fayette & Decatur	10
Selma, Marion & Memphis	150
Ohio, Brownsville & Holly Springs	20
Liberty & Magnolia	20
	3,667
Add 20 per cent. for curves and variation from air line in crossing water courses	733
Total	4,400

From this it would appear that if all these lines were completed they would be able to draw from the State subsidies to the amount of $17,600,000. But our correspondent writes us: "But few of them will ever be built, as they are mostly projected through a broken, sandy, thinly-settled section of the country, and have been brought into existence by a lot of scribblers for the various country papers. They have all been built several times already on paper with printing ink, but will never be constructed on earth with dirt."

* 25½ miles of this narrow-gauge road is finished from Ripley to Middleton Station on the Memphis & Charleston Railroad, and is the only road in the list which finished enough of its line in the required time to secure the State subsidy of $4,000 per mile.

Toledo, Canada Southern & Detroit.

A correspondent who is engaged on this road writes from Toledo that it "is in a pretty advanced state just now. The grading is completed with the exception of about ten or twelve miles; the bridge-work and masonry are being pushed on, and there is a fair prospect of the early completion of the road. The directors confidently expect to run trains over it by the 1st of January, 1873; but I doubt whether it will be done so soon. The main drawback will be getting the right of way into this city, and, indeed, the whole of the Ohio Division of the road."

Milwaukee & St. Paul.

The preferred stock is entitled to a 7 per cent. dividend before anything can be paid on the common; then the common stock is entitled to a 7 per cent. dividend, but if there is a surplus after paying 7 per cent. on both stocks, there is no longer any preference in dividing it.

Chicago & Northwestern.

There having been some question as to the extent to which the preferred stock has advantage over the common stock, it may be well to explain the terms. The preferred stock is entitled first to a 7 per cent. dividend out of net earnings; then the common stock, if enough remains, takes a 7 per cent. dividend; should there be still a surplus, the preferred stock is entitled to enough to make up a 10 per cent. dividend. The common stock then comes in for a 10 per cent. dividend, and if there should be a surplus after paying 10 per cent. on both classes of stock, they share alike in the balance.

Erie.

At a meeting of the directors on the 8th inst., the new appointments by the President were confirmed, and Edwin D. Morgan, J. V. L. Pruyn, and John W. Olyphant were appointed a committee to examine into the relations existing between the Erie and the Atlantic & Great Western, and to report their opinion of the expediency of establishing closer relations between the two roads.

The transfer books, now kept at the general office, will be closed November 7, and reopened at the office of Duncan, Sherman & Co. on the 18th.

Penobscot & St. Croix.

A railroad of three feet gauge is proposed to extend from Bangor, Me., through Cherryfield and Machias to some point on the St. Croix River, a distance of nearly 120 miles. At a recent meeting of the directors at Cherryfield, Me., Colonel Mayo, of Orono, offered to build the first 75 miles east from Bangor for $20,000 per mile, including the stations, fences, &c., and the rolling stock. It is proposed to raise $500,000 by stock subscriptions and $1,000,000 by the sale of bonds, and to build the road at once.

Bangor & Bucksport.

Bucksport, Me., has voted to take $70,000 additional stock in the road from that place to Bangor, making $135,000 in all. There is said to be also $115,000 in individual subscriptions. Surveys for the road have been commenced.

Knox & Lincoln.

The annual meeting of the stockholders of this company was held in Bath, Me., October 8. The directors report that the whole amount received up to August 31, 1872, is: On capital stock, $361,492.50; on city and town bonds, $2,395,000; earnings of the road, $107,610.57—making in all, $2,864,103.07. There has been expended, $2,725,798.44; cash and bonds on hand, $88,804.62; difference between bills payable and collaterals on same at par, $49,500. For the last ten months the net earnings have been $35,972.08. The connection with tide-water at Rockland will be made in time for the business of next season, and will, it is believed, largely increase the earnings of the road. The extension to tide-water was put under contract in June, and is now substantially completed to sub-grade, and the iron will be laid in a few weeks. Satisfactory progress has been made in the construction of the wharf at Rockland, and it will be completed this fall or early next spring, in time for the business of 1873. The land damages are mostly settled and paid, and the company now owns the best water-front in the city of Rockland. The wharf is a crib wharf, 615 feet long and 50 feet wide, with a head 90 feet by 50 feet. The whole when completed will be a very valuable property, and it is believed that cost will be within the estimate. It is hoped that during the coming year a second connection per day with Boston will be made. It will be perceived that the earnings have paid the operating expenses and a very considerable amount in construction. The directors have held themselves in readiness to co-operate with the Penobscot Bay & River Railroad Company, which proposes to build a road from Bangor to Rockland, and there is now a fair prospect of that road being built within a short time. It will be a valuable connection to the Knox & Lincoln road.

Maine Central.

The Bangor (Me.) *Whig* says:

"The improvements made on their road by the Maine Central Company this season have been very extensive—much more than most people are aware of. Seventy miles of track have been graveled, twenty-five miles of new iron laid and five miles more to be laid before snow comes; 130,000 new sleepers have been put down, and 100 tons of spikes used to fasten down the rails. Eighty miles of new fence have been built, and the company now own about 700 miles of fence. New stations have been built at East Newport, Wilton and Freeport, and the foundations are laid for the Union Station at Waterville, which is to be of brick, 131 by 31 feet, two stories high, with pavilion roofs over the platforms. A new station is also to be built at Fairfield. Water stations, each with a tank of 15,000 gallons capacity, have been or are to be built at Burnham, North Belgrade, Lewiston, Brunswick and Dresden, most of them with steam-pumps to fill the tanks. A new engine-house has been erected at Lewiston, and new turn-tables are to be placed at that station, at Brunswick and at this city. The bridges have all received particular attention. That at Skowhegan, 360 feet long, has been rebuilt; the long bridge at Waterville is receiving extensive repairs; that at Kendall's Mills has been strengthened by the addition of arches in all the spans, and the tops of the bridges between here and that place are being covered with tin, to preserve the structures against fire and from rain and snow. A large number of new bridges have been built, including two at Topsham (one of iron across the Androscoggin, 875 feet long and costing $70,000, and another short span), two new Howe truss bridges in Bowdoinham, two near Harward's road, one over Freeman's Creek in Richmond, and one at Clinton. Last Sunday one span, 150 feet long, of the bridge at New Meadows, was replaced by a new one, and next Sunday another of equal length will be put in place. A new bridge is framing to replace that over Water street in Hallowell, and another will soon be placed over Royal's River in Yarmouth. The stone is ready for a new arch at 'Shaw's Bridge,' about four miles from this city, and numerous other bridges are to be repaired. It will be seen that the work in the engineer department has been enormous, 1,140 men being now employed, and the last month's pay-roll in this department will amount to about $35,000."